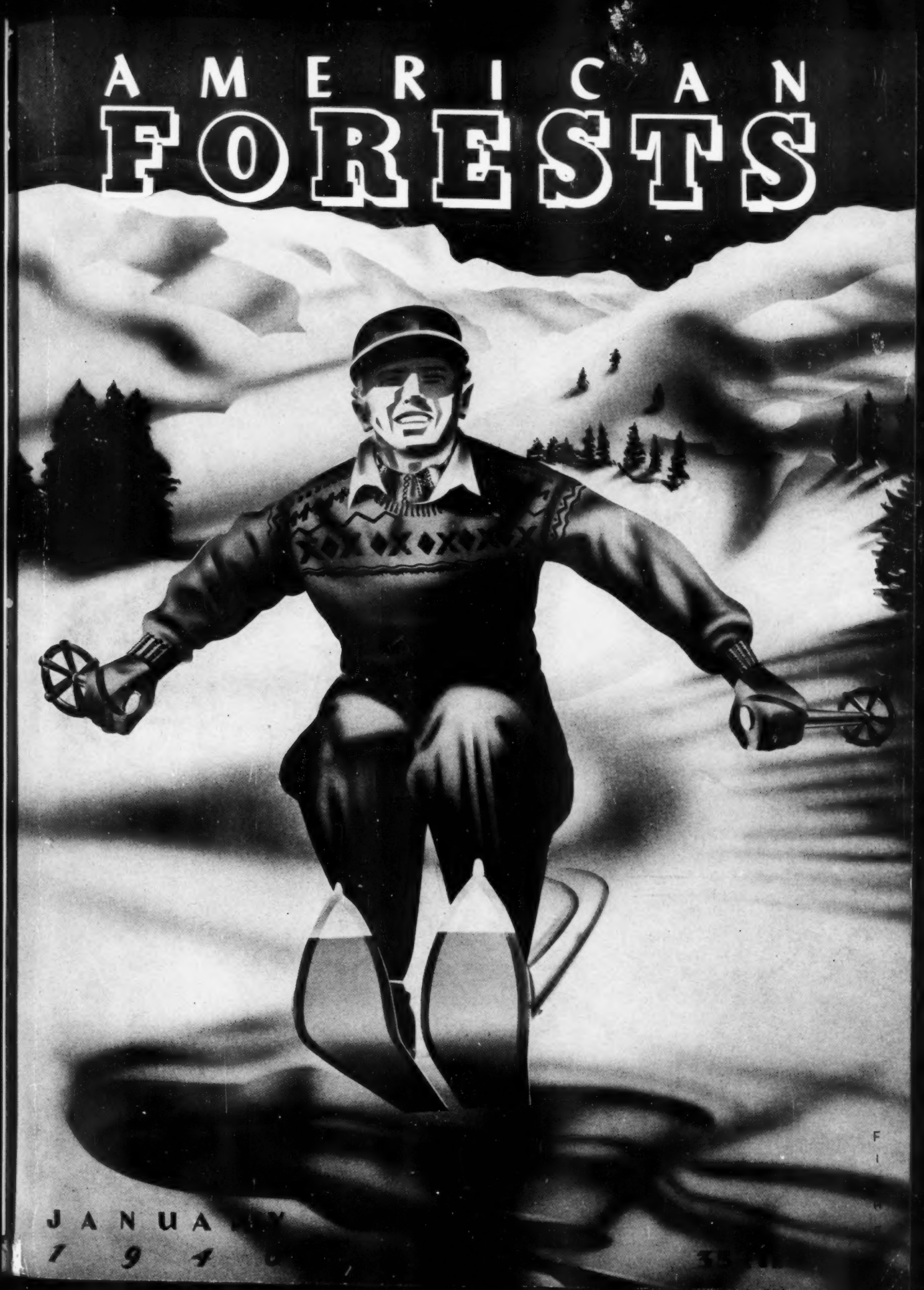
AMERICAN FORESTS



JANUARY
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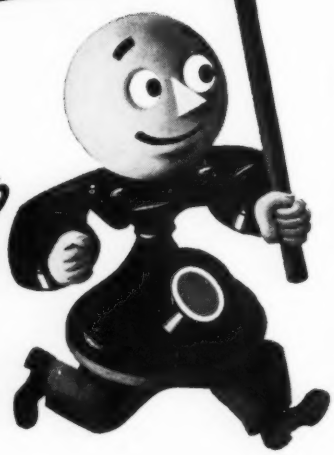

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AMERICAN FORESTS

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The Purpose

The American Forestry Association is a national organization—educational in character—for the advancement of the intelligent management and use of the country's forests and related resources of soil, water, wildlife and outdoor recreation. Its purpose is (1) to bring about adequate protection and perpetuation of these resources by creating an enlightened public appreciation of the need of conserving them through wise use for the present and future welfare and enjoyment of all the people; (2) to make available to Americans in all walks of life a wider knowledge and appreciation of their forest resources and the part they can play in the social and industrial life of our nation.

The History MORE THAN half a century ago American men and women of vision, stirred by the rapid destruction of forests and forest life in the United States, began to raise their voices in behalf of conservation. Foreseeing the danger of allowing America's rich forests and vast natural wealth to be thoughtlessly wasted, these public-spirited individuals protested the needless destruction that was taking place. Out of their efforts came a collective force,—The American Forestry Association, first organized in 1875 and made a national influence in 1882.

The Record THUS The American Forestry Association has a long record of efficient public service. The establishment of the United States Forest Service and the creation of the nation-wide system of state and national forests and parks were due in no small part to the Association's efforts. Its educational work, extending over more than seventy years, has stimulated public action and built public support for protection against forest fires and floods; for prevention and control of soil erosion; for the development of conservation policies in forest management for continuous production through wise use; for the control of forest insects and diseases and the preservation of fish and wildlife.

The Support FROM AN ORGANIZATION of a few hundred members three decades ago, the Association has attained a substantial membership of many thousand men and women, living in every state in the Union and in foreign countries throughout the world. The funds of the Association are administered by a Board of Directors composed of individuals of national standing—men and women who give their services free, who have a practical understanding of the nation's present-day conservation needs, and are equipped through experience, ability, enthusiasm and training to advance the Association's program.

The Program BECAUSE OF its independent, non-political character, the work of The American Forestry Association is vitally necessary in the field of public service. It provides an unprejudiced influence for the development of sound conservation measures. It helps coordinate public, state and federal policies. It cooperates closely with federal, state and private agencies in conservation work. At the same time it initiates, sponsors and carries on needed projects in conservation in addition to its regular broad continuous program of education.

my Favorite Tree

By HAROLD L. ICKES
Secretary of the Interior

I am so fond of trees generally that I find it difficult to decide which one I like the most. The American elm always has appealed to me, but I think that for majesty and sturdy character the bur oak is strikingly impressive, especially when found on rich, moist land in association with other bottomland trees, such as the hickories, walnuts, and other oaks, where it attains its maximum development. The mature bur oak with its irregular crown; stiff, gnarled branches; and stout, corky-winged branchlets inspires in me a feeling of a strong-hearted veteran whose knowledge of the world is ages old and whose faith in the future is everlasting.

Representatives of this species have attained a diameter of 7 feet and a height of 175 feet in favorable locations. Yet on dry, sandy soils and under adverse growing conditions, where other species are unable to maintain themselves, the bur oak adapts itself to an unkind fate and over extensive areas constitutes almost the only specimen of arboreal life. From the rugged hills of Maine and Vermont it extends westward to the dry uplands of North Dakota and its range reaches nearly to the Gulf of Mexico in Texas. In this wide area it takes various forms and ministers to many needs of mankind, but whether tall and stately or short and scrubby, this oak persistently maintains its determined independence. It is true to the American tradition.

THE FOREST EXCHANGE . . .

Aircraft As a Forest Hazard

SIR: Since the end of the war, a new hazard has come to the forests of the United States. More and more airplanes will be flying, crashing and burning. Someone must be responsible for aircraft crash fire fighting in the years to come.

It has been shown, in my experience, that the greater part of aircraft crashes occur in forested or mountainous terrain. Virtually all of them are in inaccessible locations. A municipal fire department is useless under such circumstances. An organized military crash crew is little better. It seems that such crashes could best be handled by those experienced in fire fighting under such conditions—that is, the organized state and federal forest services.

It would cost little more to maintain year-round lookouts instead of eight-month ones, as at present. Existing forestry trucks may be altered easily to combat aircraft crash fires without impairing their normal uses.

I would appreciate any comment on this subject.—*Timothy G. Stillman*, Chico, California.

What to Do with Tillamook

SIR: I am very much in favor of your organization. I believe it can be a great deal of help from an educational standpoint in bringing the need for conservation to the American people.

The reason for my interest in writing is that I have been the County Judge of Tillamook County, Oregon, since 1938. During this period I have had an opportunity to observe the destruction of some of the finest timber in North America. Before the fire of 1933 our tax base was around $31,000,000 and now it is around $11,000,000. We have approximately five percent agricultural lands, which are fully developed, and the rest is timberland where 375 thousand acres burned in 1933, 1939 and again in 1945. We fully expect another fire of greater proportion in the next five or six years unless something is done to protect this area . . . .

Each new fire eats deeper into the rich soil that is so necessary to the growth of fine trees. It is a sickening picture to anyone who observed and knew this country prior to the fires. It is a graveyard of snags for miles.

We believe all this can be cured. We believe it should be planted and protected, as all our forest areas should be . . . We firmly believe that unless a program is worked out along this line we will lose our remaining timber. Once a fire gets started only the hand of God will put it out. We know because we have experienced it.—*Harland M. Woods*, Tillamook, Oregon.

A Salute to Georgia

SIR: The American Forestry Association has rendered this nation signal service by stimulating an intelligent interest in forestry, conservation and parks, as well as in related fields . . .

Our people in Georgia are beginning to recognize the value of our native forests. Considerable progress has been made in the reduction of the annual burning of the woods during the early spring. The expansion of the paper manufacturing industry in our state has made the farmers more particular about fires. Many millions of slash and loblolly pine seedlings have been planted during the past 10 years. Selective timber cutting is being practiced more extensively. Several hundred of Georgia's rural schools have established small school forests and the subject of forestry has been given greater emphasis in the vocational program of the schools. The newspapers of the state in cooperation with the garden and nature clubs have greatly reduced the practice of destroying the blooming shrubs along the highways in the spring-time. Many state, county and city parks and recreation centers have been developed.—*H. Reid Hunter*, Atlanta, Georgia.

Hemlock, the Looper and Socrates

SIR: It seems unfortunate that, in Stewart Holbrook's article in the October issue, "Loopers in the Big Timber," he refers to the looper as fattening "on the stuff that laid Socrates low." I quote L. H. Bailey's *Standard Cyclopedia of Horticulture:* "Hemlock in Old World literature is what is known as poison hemlock, an unbelliferous herb, *Conium maculatum*.

Surely not *Tsuga canadensis*. I think AMERICAN FORESTS should set a better standard of botany.—*A. B. Dirnock*, New London, Conn.

About "Democracy and Wildlife"

SIR: I have been very much interested in William H. Bayliff's very informative article "Democracy and Wildlife" in the November issue.

I heartily agree with the author's conclusions that "our game laws must be supported by a public conscience which gives wildlife a status above property, protecting the animal world by a system which is ethical as well as legal." In fact I would go a step further and say that all living things, vegetable as well as animal, should be considered as having one life with us. I go back several "days" further than Mr. Bayliff in the first Chapter of Genesis and gather that it was not until "the Spirit of God moved upon the face of the waters" that "the earth brought forth abundantly." The quotation he gives from Genesis begins: "And God said" let man "have dominion over" every living thing. The Hebrews are said to have lived under a theocracy; God was their ruler and judge; they were responsible directly to Him.

I have for a long time thought that this feeling of the ancient Hebrews that God had committed animate nature to them for use and that therefore they were responsible to Him for its right use, was the foundation stone of real conservation. And by "real conservation" I mean the maintenance and perpetuation of species and ecological types for their own sake as well as for the benefit of present and future generations. I think Mr. Bayliff misinterprets his quotation from Genesis when he claims that God-given "dominion" has "led inescapably to despoliation of forests, to pollution of streams, destruction of nesting sites and spawning grounds and to the clearing of natural habitats of all but a remnant of their former wildlife inhabitants." Have not these calamities come about, as did the many which afflicted the Children of Israel, through neglect of God, through disobedience and not through the observance of the Mosaic philosophy?—*J. S. Holmes*, Raleigh, North Carolina.

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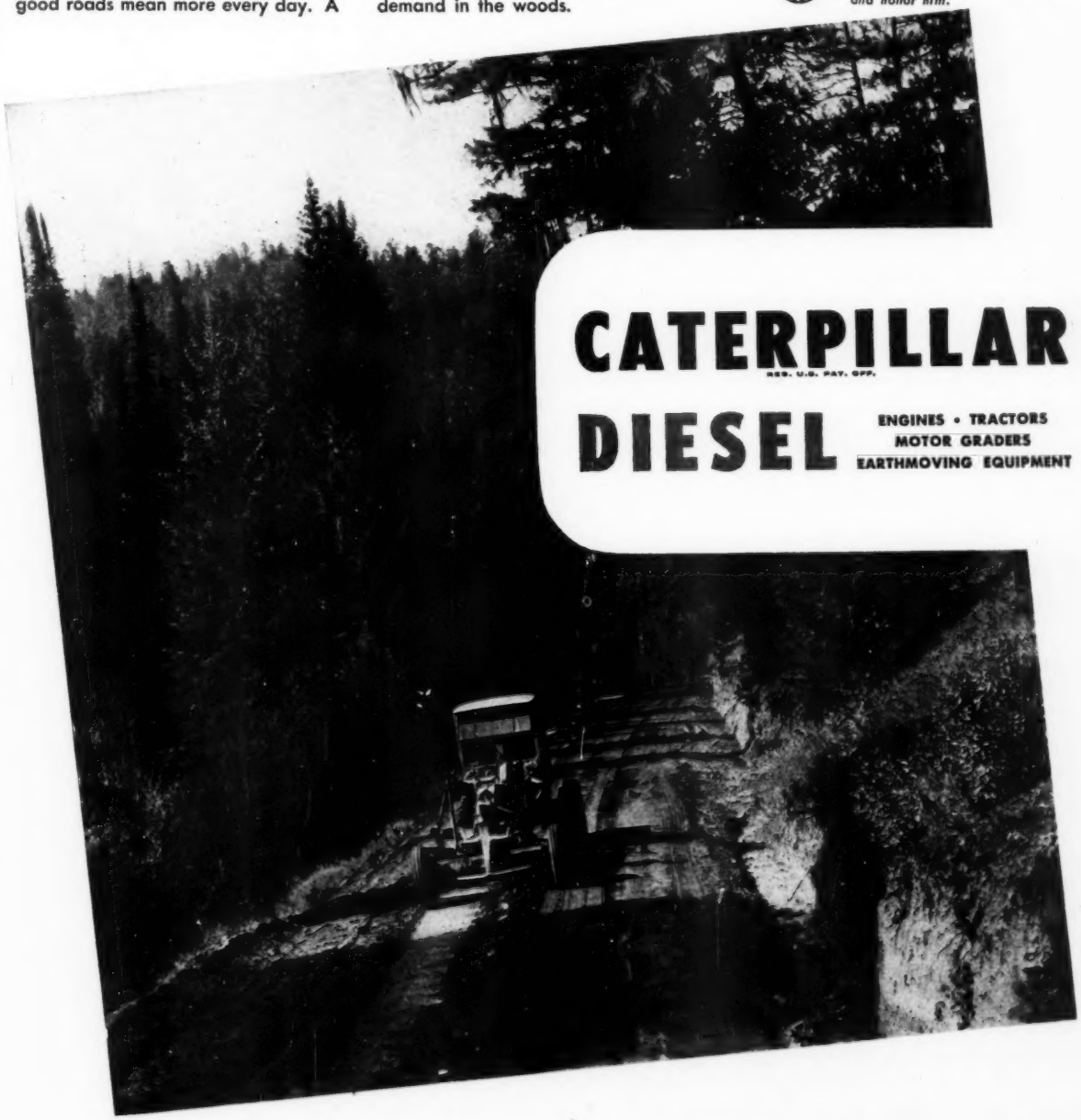

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CONSERVATION IN *Congress*

By A. G. Hall

A NATURAL resources policy for the United States is proposed in S. 1634, introduced by Senator McCarran on November 29. In the objectives of the proposed act, it is clearly stated that "the future prosperity of the nation depends to a large extent upon sound conservation and proper utilization of our natural resources".

In order to effect such conservation and use, "it is necessary to know at all times, and in the greatest possible detail, what these resources are, where they are located, the rate at which they are being depleted, and indicated changes in such rate on the basis of the probable future requirements of our national economy". Further, the bill states, "the nation's irreplaceable wealth of natural resources is not composed of isolated segments which can be dealt with piecemeal". Among other things, the bill calls for a national inventory of all natural resources, an annual accounting of the rate of depletion, estimates of probable future production, utilization, and depletion.

The bill would create a natural resources council consisting of the Secretaries of Agriculture and Interior and three other members, appointed by the President, one of whom would be closely connected with agriculture, forestry, or soil conservation. This council would be directed to encourage and foster development and utilization of natural resources, to maintain inventory records, to administer a natural resources stock pile, to stimulate research by private and public agencies, to utilize the facilities or services of other government agencies, and to issue such orders and make such decisions as may be necessary in a national policy.

Within two days, December 12 and 13, and not quite two weeks before Christmas, seven bills were introduced in the House and one in the Senate to prohibit the exportation of logs, lumber, and certain lumber products until the United States needs for housing and other construction are met. The epidemic was started on December 6, when H. R. Northrup, secretary-manager of the National Retail Lumber Dealers' Association, sent a letter to the director of War Mobilization and Reconversion, decrying the shipment of lumber abroad in the face of dire needs for it at home. Copies of this letter were sent to the Congress on December 7. Mr. Northrup's statement that the 1945 export of lumber would be about 750 million board feet, enough to build between 75,000 and 100,000 badly needed dwelling units in this country, doubtless struck a responsive note among the Congressmen wrestling with the new Patman Bill (H. R. 4671) which would establish a housing czar and set ceilings on housing costs, and even subsidize housing if necessary. (Although export quotas of almost a billion have been approved, less than 400 million feet is estimated as the actual 1945 export.)

In any event the question which quickly came to a head is whether, in the face of a decline in lumber production at home the United States is going to recognize the difference in the definition "homelessness" in war-torn countries abroad and in the world's richest nation. Whatever the outcome of the various bills, it seems certain that the activity in Congress will result in closer scrutiny of export licenses for lumber and other forest products. It should result, too, in some scrutiny of lumber use in this country. H. Res. 456, providing for an investigation of the surplus lumber situation, was also introduced on December 13.

Government reorganization authority comes a step closer to the White House. H. R. 4129, providing for the reorganization of government agencies, was sent to conference on November 20. As agreed to in conference, and reported in the House on December 12, the bill is generally similar to that passed by the House on October 4. From the conservationist's standpoint, important changes provide that: no reorganization plan may affect any civil function of the Corps of Engineers; the Civil Service Commission is not exempted from reorganization; no reorganization may take effect unless the plan is submitted to the Congress before April 1, 1948.

H. R. 4805, the deficiencies and supplemental appropriations bill for fiscal year 1946 provides for an additional $4,000,000 for forest roads and trails, half of which is for forest development roads and trails, being part of the $12,500,000 authorized to be appropriated for the first postwar fiscal year (by the Act of December 20, 1944) and half is for forest highways, being part of the balance of $7,000,000 authorized to be appropriated for the fiscal year 1942. For the General Land Office, for fire protection and timber management on the public domain, $62,000 is requested. The Bureau of Reclamation items are $20,442,000 in the reclamation fund for salaries and expenses, general investigations and projects, $42,765,000 for construction under the general fund, $3,000,000 for the Boulder Canyon project, $250,000 for Colorado River development fund, $480,000 for the Fort Peck project, and $10,269,100 for the Missouri River Basin.

For the National Park Service, additional appropriations are requested as follows: $20,000 for salaries and expenses, $35,000 for regional offices, $100,000 for national parks, $30,000 for national monuments, $51,000 for national historical parks and memorials, $25,000 for national military parks, battlefields and cemeteries, $5,000 for the Boulder Dam National Recreational Area, $10,000 for recreational demonstration areas, and $70,000 for salaries and expenses, national capital parks.

(See "Conservation Calendar" p. 42)

A. G. HALL JOINS STAFF

A. G. Hall, for the past three years special assistant in the Lumber Division of WPB, has joined the staff of AMERICAN FORESTS as an assistant editor. He also will serve as director of information for the American Forestry Association.

A graduate of Penn State Forest School, Mr. Hall's experience includes both state and federal work.

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NORTH CAROLINA

Editorial

OUR CHANCE IN 1946

THIS fall the major forest interests of the country, both public and private, will meet in Washington to chart a postwar conservation program. They will have before them down-to-date information on the state of our forest resource after four years of war. The occasion will be the American Forestry Congress called by The American Forestry Association. The facts will be the fruit of the Association's Forest Resource Appraisal.

There is, of course, no argument against the need for such a Congress. The inescapable fact is that a tremendous amount of high-quality timber was needed to win the war, that the accelerated war cut of lumber, pulpwood and other forest products will be felt in our forest economy for years to come and that, as a result, many of our present concepts and practices in forest management must be altered. To what extent and in what direction will rest not only upon our overall forest situation as disclosed by the fact-finding survey, but also upon our ability to appraise and deal realistically with the many war-born forest problems.

For example, how far can we go in supplying lumber and other wood products for the rebuilding of war-torn Europe? While this is fundamentally a problem of world supplies, it is safe to say that many look upon it primarily as a problem of American production. Other peoples, perhaps more than our own, are conscious of the resources and industrial genius that enabled this country in a single war year to produce better than 36 billion board feet of lumber, and to maintain throughout the entire war period an annual production in excess of 31 billion feet. And these peoples are already vociferous in their demands for American lumber, even while our home market is begging for this commodity.

One of the first things the American Forestry Congress will have to decide is whether or not this country's forests, after the heavy war harvest, are able to support a lumber production of around 30 billion board feet a year, estimated as necessary to meet domestic needs and contribute materially to Europe's rebuilding.

Our forests, on the basis of prewar figures, are growing this much wood, and more, each year. But 30 billion feet is just the drain occasioned by lumber production, and the growth, for the most part, is in smaller trees which will not be ready for harvest for some years to come. The total commodity drain, including that for pulpwood, fuelwood and other non-lumber products, is estimated as around 50 billion board feet, and an additional five billion feet is consumed by fire, diseases and insects. It does not help the immediate problem of supply to point out that the average acre-yield in this country can be doubled or even trebled by more intensive management. Reconstruction, and our own building needs, cannot wait that long.

Perhaps the United Nations Organization in its striking of world balance sheets for the reconstruction period will provide a basis on which this No. 1 forestry problem can be handled internationally.

Within this major problem are a number of component ones that will require attention in 1946,—how to check the little known but enormous forest drain caused by tree diseases and insects, for instance. Few realize that of the non-commodity drain on our forests 58 percent is chargeable to these tree-killing pests, as compared to 42 percent due to fires.

Seventeen percent of the cut of Douglasfir is lost because of heart rot —and Douglasfir represents nearly one-third of the sawtimber in this country. Pathologists know that losses can be reduced by cutting the stands when they are relatively young, and they can estimate the extent of decay. But, to apply this knowledge to forest management for sustained yield, many questions are yet to be answered.

Similarly, what is known of heart rot in western redcedar, Sitka spruce and Noble fir, red rot in ponderosa pine, wilt of red, black and scarlet oak, fusiform rust of the southern pines, to mention a few, must be supplemented with more research before any large-scale effective control measures can be undertaken. The unexplained dying of western white pine and of yellow birch are only two problems on which needed research has been delayed because of lack of funds. In most of the areas where forest diseases or tree insects are taking their toll, trained men are too few to cope with the problems.

Losses from forest insects and the possibilities of their reaching epidemic proportions are too little realized. In the decade following 1910, the spruce budworm destroyed 225 million cords of pulpwood in the northern states. The budworm is now rampant in Ontario and Quebec, and entomologists predict another epidemic in Maine, New York and the Lake States. In the West losses inflicted by the pine beetle are tremendous. The potentialities of gypsy moth damage in the East demand strengthening of control measures.

A postwar program of forest conservation cannot ignore the magnitude of this non-commodity drain.

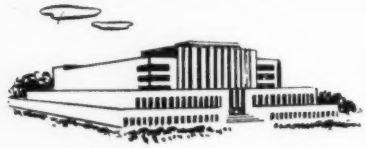
That forest fire losses have been kept at a reasonably low figure is due primarily to the amount of money made available for their prevention and suppression. The current federal appropriation for fire control amounts to around $13,000,000. States and private owners are spending an even greater sum. In comparison, federal funds available for the control of forest diseases and insects which are destroying more timber than fire, are less than one-third of those for forest fires. This comparison in no way implies that too much money is being spent for fire control. Quite the reverse is true. It serves to bring home the pitifully small amount of money now available for solving the insect and disease problem, considering its magnitude in terms of forest depletion.

This is but one of numerous problems which a postwar program of forest conservation must face and provide for. If we are well informed and face them fearlessly and realistically, with full regard for all interests concerned, it is possible that we can at last achieve for American forestry the base it needs for full and uninterrupted progress.

Certainly we will have our chance in 1946.

The photographic artistry of the late John Kabel is eloquently expressed in this Deep South scene—"Pine Along the Gulf"

HOUSE OF WOOD MAGIC



Beginning a series of articles on the war achievements of the U.S. Forest Products Laboratory

By ERLE KAUFFMAN

DURING the past four years, achievements of the U. S. Forest Products Laboratory at Madison, Wisconsin, read like something out of the Arabian Nights. Boxes that fly, wood as hard as steel, paper with the strength of aluminum—these are but samples of the wizardry this house of wood magic pulled out of its bag of tricks when called upon to fashion the products of America's forests into effective weapons of war.

Actually, of course, there is no wand-waving at Madison. The magic produced there is the magic of research. Since 1910, when it was established as the first governmental forest products laboratory in the world, it has, through research, worked continuously toward the attainment of "maximum permanent benefit to society through the sustained production and use of forest products and services."

To put it another way, the job of the laboratory, functioning under the U. S. Forest Service, is to obtain and disseminate scientific and technical information on wood and other forest products needed in the production of timber crops, in economically converting timber into useful products, in increasing their serviceability and broadening their markets, and in their satisfactory distribution to and use by the consumer.

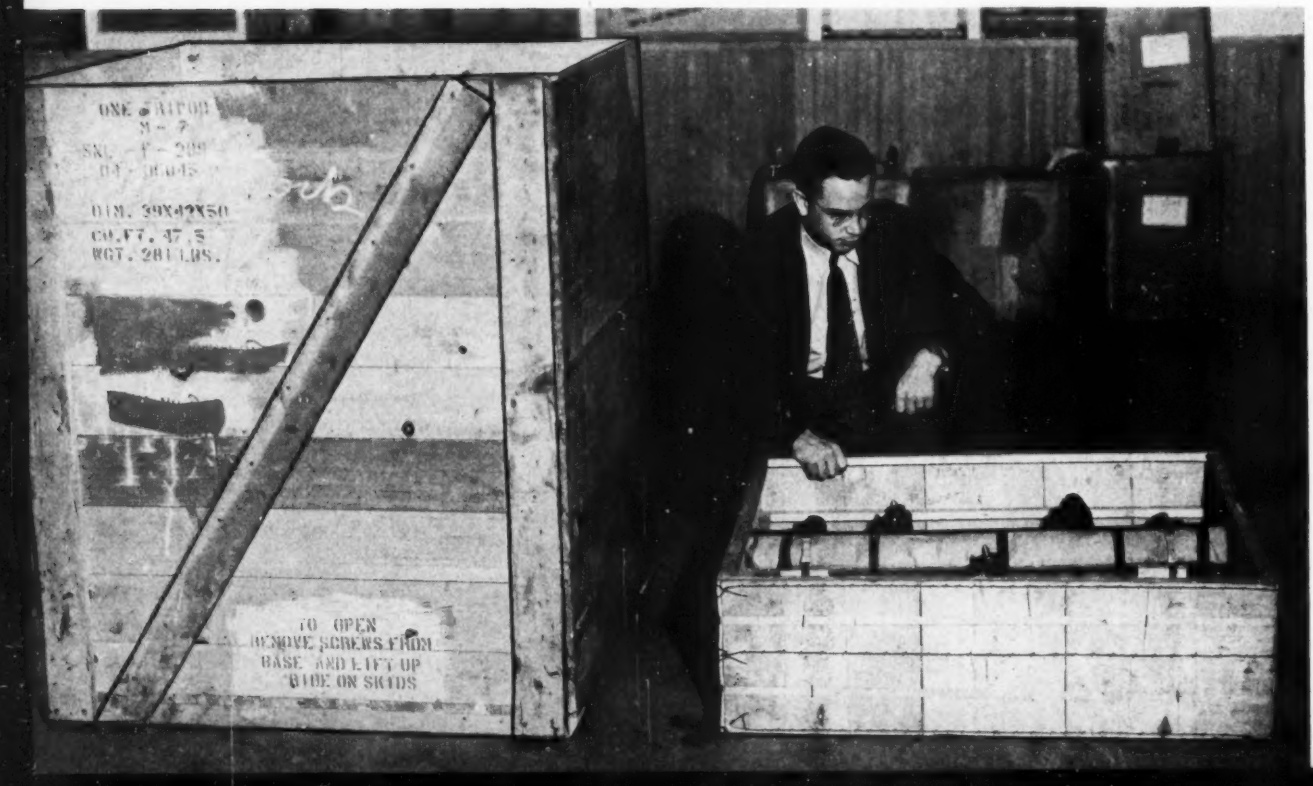
This is its peacetime job. In 1941, its whole program was switched to the problems of a nation engulfed in technological war. Its staff of less than 200 veteran researchers jumped to around 700. So-called "fundamental" research was put in cold storage, jobs of incidental importance were shelved. Only research vital to the immediate needs of the armed services and war plants of the country was given right-of-way.

Up until recently, because of military censorship, what transpired in the inner sanctum of this great research center in war dress has been revealed only indirectly. For example, it was no secret that the laboratory early in the war took on the job of designing boxes, crates and other protective methods for war materials destined for hazardous voyages to the battlefields of Europe and Asia. So when news leaked out a year later that damage losses in the shipment of these vital supplies had dropped from fifty to three percent, it was only too obvious that the men of Madison were making their magic work.

Then came reports that by more compact packaging enough cargo space was saved to transport in four ships what previously had required five. And finally, by even more skillfully designed boxes and crates, a billion board feet of lumber were saved at a time when war supplies of forest products were critically short. More magic, working overtime.

But packaging, while unquestion-

More compact packaging saved both cargo space and lumber. Here are original (left) and redesigned boxes for AA gunfire director tripod



Alcohol production—in one-eighth the time required by Germany

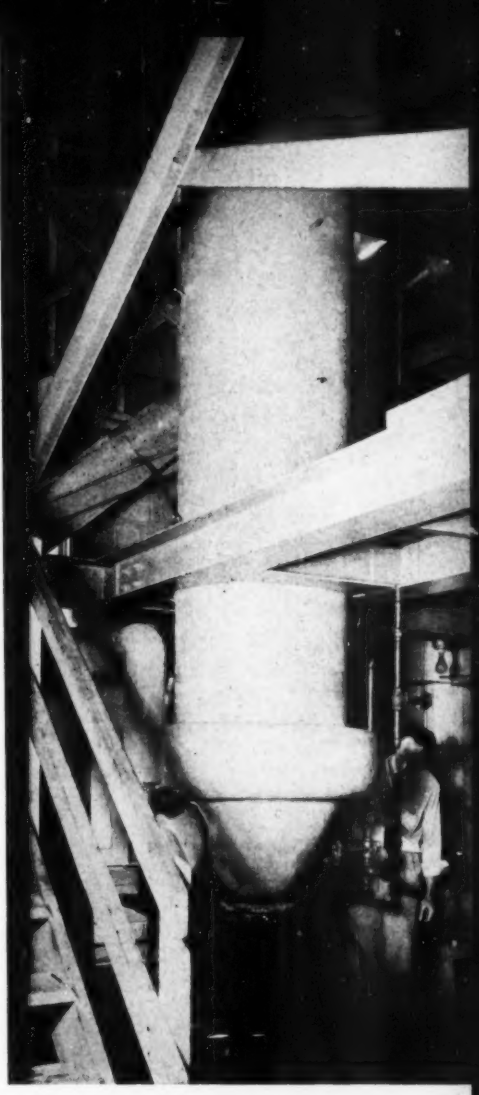
ably the most important, was but one phase of the laboratory's many-sided war job. In the first days of the war when the greatest air force the world has ever known was just a gleam in the eyes of our generals, little was known in the field of design and construction of wood aircraft. The men of Madison tackled the job and their success was written on every bomb dropped on Germany and Japan, for the airmen who dropped them learned their deadly business in wooden training planes born in Madison's house of wood magic. So were the gliders that "darkened the sky" over Normandy on D-Day.

The story of this great achievement is the story of such new techniques developed at Madison as "sandwich construction," as "bagmoulding" plywood for wings, fuselages and other curved skin surfaces; the moulding of propellers and aerial masts from compressed resin-treated wood; new wood-base and paper-base materials; and pulp reinforced plastics. It is the story of new and improved methods to accelerate the drying of wood, of new synthetic glues.

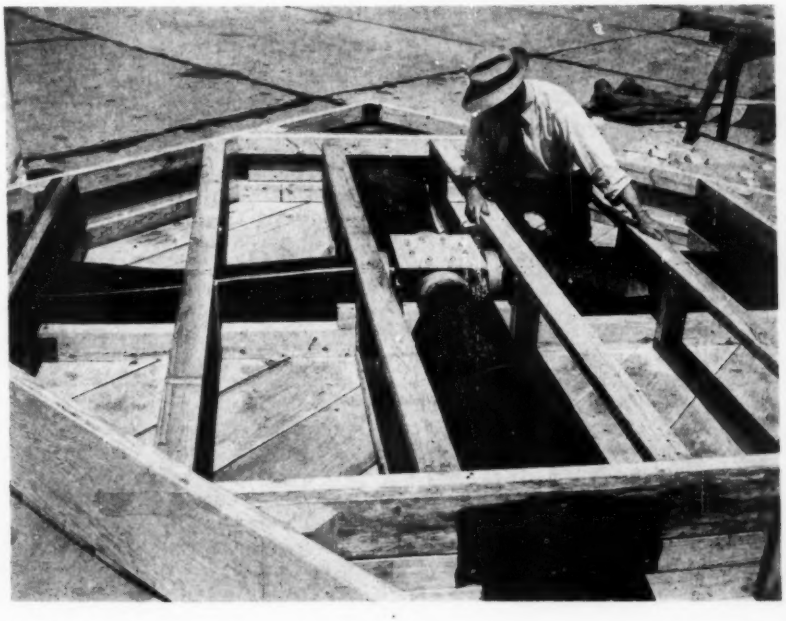
When shortages of large high-quality white oak and Douglasfir timbers suitable for keels, stems and other large structural parts of ships and boats began to show up, the laboratory developed laminated ship timbers—gluing relatively thin boards together—so successfully that before the end of the war lamination of both straight and curved ship parts was being done in a number of navy yards.

Production of ethyl alcohol from wood is another outstanding achievement at Madison. With pilot plant fermentation apparatus, laboratory technicians adapted and improved upon the Scholler process used in Germany prior to the war to make ethyl alcohol from wood. It transformed the German batch process into a continuous one and reduced the time necessary for alcohol production to one-eighth that required in Germany, while at the same time stepping up yield of alcohol per ton of wood by 10 percent. Furthermore, it devised ways of cutting production costs by developing by-products of the fermentation process, including a fodder yeast rich in vitamin content.

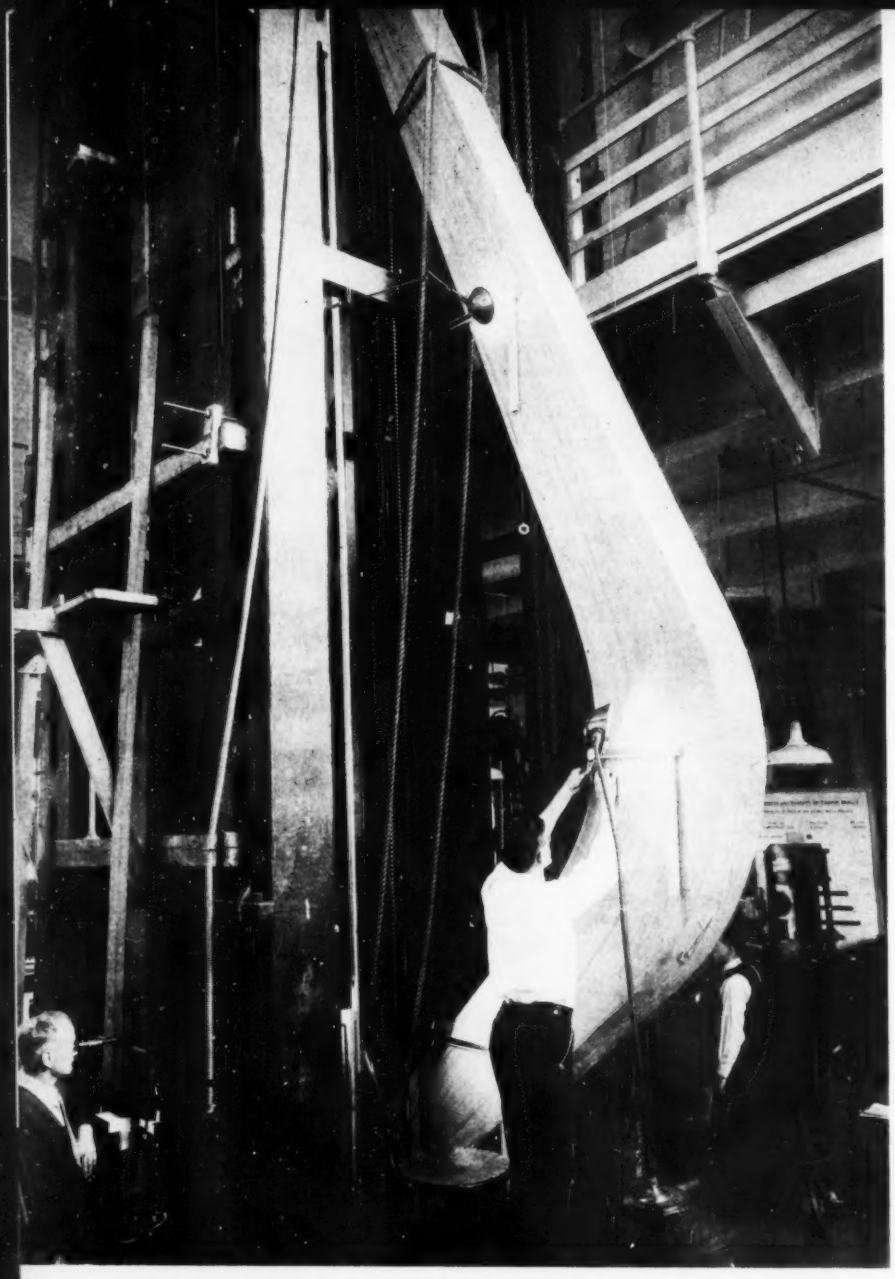
These and other forest products research achievements that helped the nation to victory in World War II will be dealt with more fully later on in this series. The No. 1 war story at the laboratory is packaging, mainly because the war could not have been won without it, but also because packaging consumed, from 1943 on, one out of every two board feet of lumber produced in this country, or around 17 billion feet a year. Indeed, it has been said that the lumber used in war packaging would add up to enough to build an airplane landing



A propeller is boxed—fully assembled and ready to mount



Gluing up a laminated ship timber



Testing prefabricated glued wood arch. Hundreds of buildings were erected during the war with laminated arches as the supporting units

mat, an inch thick and 120 feet wide, around the world at the equator.

To appreciate fully the importance and magnitude of the packaging program, it is well to remember that when this country became engulfed in technological war, a great many people wondered if we could overcome the element of time and an enemy who had already demonstrated his capacity to devise and employ new and horrible weapons of destruction. The answer, of course, is now history, climaxed by the blasts that leveled Hiroshima and Nagasaki.

In themselves, however, our inventive and production achievements, as spine-chilling as they are, did not win the war. Not a single Jap plane was brought down over Okinawa by radar stored in a Brooklyn warehouse. The Battle of the Bulge would have been lost had not the weapons that won it, from the amazingly delicate proximity fuse to massive motorized equipment, been delivered from factory to front on time and ready for use.

Thus, logistics, the moving of armies and supplies, as every military man knows, while not as good headline copy as uranium or distance-eating B-29's, was the mainspring of our far-flung war effort and, as such, was the object of technological research as painstaking as that which produced our most secret and effective weapons. And because wood in one form or another was the natural packaging agent for practically every item to leave these shores, from bombers to powdered eggs, the great bulk of this research was centered in the Forest Products Laboratory.

Fortunately for the allied cause, some packaging research has continually been in progress at Madison since the invention of the box-testing drum shortly after the laboratory was established. This was stepped up for the first World War, but packaging requirements then were not so exacting nor did they approach the vast scale of World War II. One indication of this is that to meet the challenge of Pearl Harbor it was necessary to increase the packaging staff at Madison by 6,000 percent.

In normal times the function of an efficient package is to deliver the commodity to its destination in a satisfactory condition at minimum cost. War on a global basis adds the hazards of extremely rough handling, particularly at beachheads, severe exposure to a wide range of climates, from arctic cold to tropical humidity, and prolonged outdoor storage. As one laboratory spokesman put it, "Every box or crate had to be its own warehouse when unloaded in England, India, or Okinawa."

Thus the wartime packaging program launched at Madison in 1941 was more than exterior boxing and crating. It included the related problem of interior packaging, cushioning, supporting, bracing and cradling of the items to be packed. And it took into consideration sterilization of metal parts and corrosion prevention —for even fingerprints remaining on metal are a source of corrosion and had to be eliminated.

The amount of research involved was staggering, particularly after the tempo of war was stepped up and the front lines began demanding that weapons, ammunition, aircraft, tanks, trucks and the multitude of other equipment be delivered into the hands of the troops *intact and fit for instant use.* Many lessons were learned the hard way—failure of the packaging to withstand sea water, decay, mold, corrosion and rough handling. They were learned, however, and in time,

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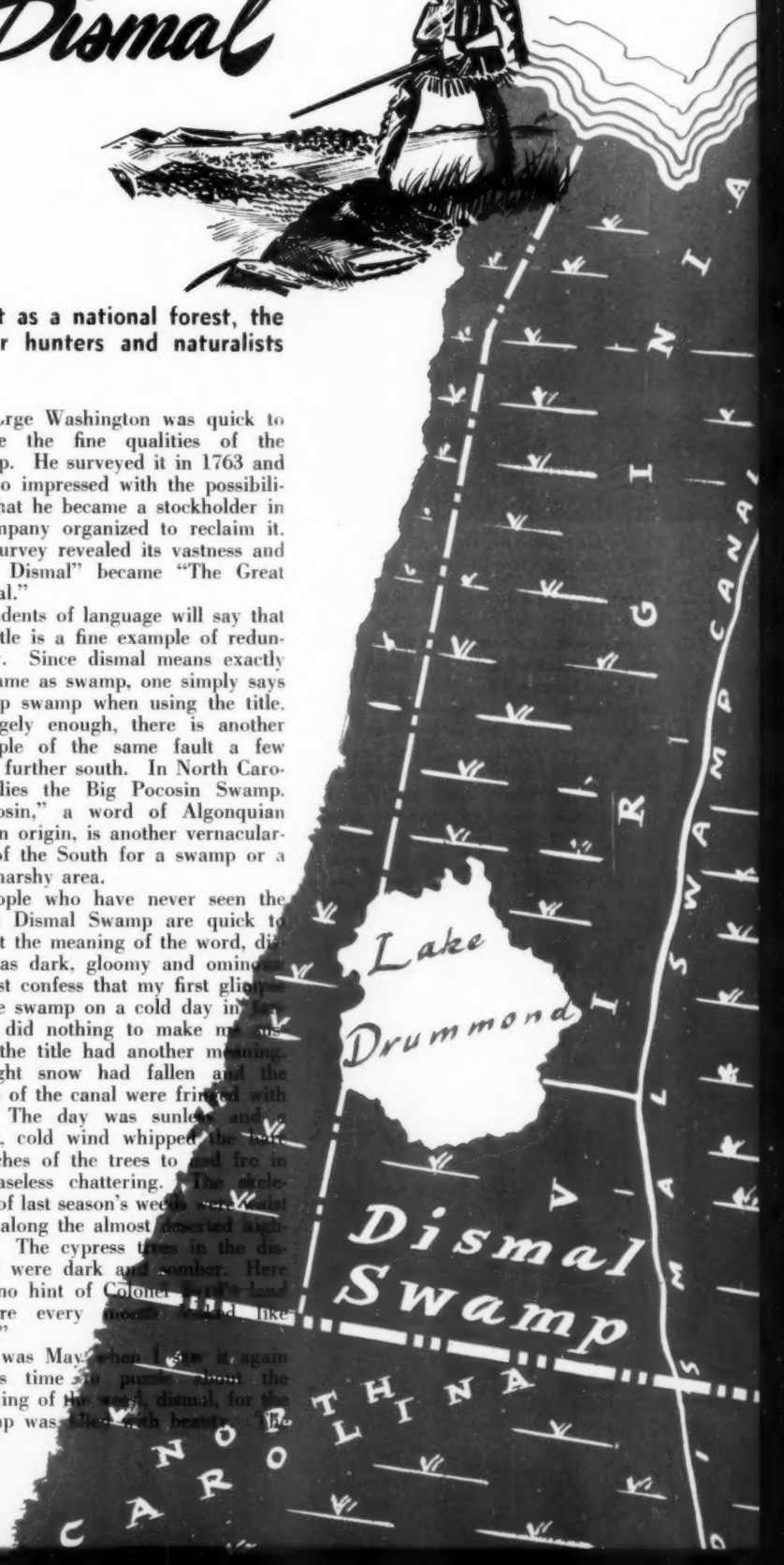
The Great Dismal

By GAIL JARVIS



Now being considered for establishment as a national forest, the Great Dismal Swamp is a paradise for hunters and naturalists

"A DISMAL, yea, a great dismal," reflected Colonel William Byrd as he trudged through the quagmire of the Great Dismal Swamp south of where the city of Norfolk now stands. The significance of his thought was then obscured by the importance of his mission to chart the North Carolina-Virginia boundary line.

Two years later, in 1738, Colonel Byrd wrote a detailed description of this area in his *History of the Dividing Line* in which he referred to it as "the dismal." This is the first time the name appears in an official document. Some historians contend that he purposely gave the swamp an unattractive name because he intended to ask the King of England for the tract and desired it to appear worthless. Others are inclined toward the idea that the elegant Byrd was disgusted with the cold, wet, uncomfortable place and that the name reflected his displeasure.

It is true that he asked the king for the tract—and that his request was ignored. But if the good colonel were disgusted with the swamp, he forgot about it when he came to describe it. He does refer to the malodors of the slime and muck but he also extols the area as one in which "every season looks like spring and every month like May."

It takes only a little research to discover that the noun, "dismal," was and is the generic term in the South for any low swampy land. He was no more in error in calling it "the dismal," than he would have been in calling it "the swamp." Little did the colonel dream that future generations would assign a disagreeable connotation to the word dismal.

George Washington was quick to realize the fine qualities of the swamp. He surveyed it in 1763 and was so impressed with the possibilities that he became a stockholder in a company organized to reclaim it. His survey revealed its vastness and "The Dismal" became "The Great Dismal."

Students of language will say that the title is a fine example of redundancy. Since dismal means exactly the same as swamp, one simply says swamp swamp when using the title. Strangely enough, there is another example of the same fault a few miles further south. In North Carolina lies the Big Pocosin Swamp. "Pocosin," a word of Algonquian Indian origin, is another vernacularism of the South for a swamp or a low marshy area.

People who have never seen the Great Dismal Swamp are quick to accept the meaning of the word, dismal, as dark, gloomy and omino[us]. I must confess that my first glimpse of the swamp on a cold day in February did nothing to make me suspect the title had another meaning. A light snow had fallen and the edges of the canal were fringed with ice. The day was sunless and a bitter, cold wind whipped the bare branches of the trees to and fro in a ceaseless chattering. The skeletons of last season's weeds were waist high along the almost deserted highway. The cypress trees in the distance were dark and somber. Here was no hint of Colonel Byrd's land "where every month is like May."

It was May when I saw it again—this time to puzzle about the meaning of the word, dismal, for the swamp was [illegible] with beauty. [illegible]

Once started, the fires are difficult to control in the swamp. One peat fire burned for three years

The spongy earth of "Ol' Dismal" is respected even by loggers, who use fallen trees for paths

air was soft and warm and filled with the fragrance of flowers. Tiny bell-like honey cups flung their sweetness everywhere and the extravagant blossoms of the loblollybay gave off a delicate perfume. The scarlet trumpetvine swung its vivid horns in the sunshine while white and yellow honeysuckle covered every dead stump or fallen tree. The huckleberry bushes were fat with the promise of a fruitful summer and thousands of bees worked in an exhaustive fashion.

True I was warned not to leave the train without donning hip length rubber boots. The experienced swamp worker skips about in this heavy footgear with all the grace of a ballet dancer, but a novice like myself found walking difficult if not virtually impossible. The boots are necessary to protect the swamp worker from dampness as well as from rattlesnakes and water moccasins, plentiful in the early part of the summer. Much of the swamp is covered with dark brown water that varies from a few inches to several feet in depth.

Sportsmen call the swamp a hunters' paradise, though of course, it isn't "what it was 50 years ago." In 1838, a Captain Wallace, living near the Feeder Ditch, killed 30 black bears on his farm. In the same year, 27 bears—a large one may weigh 600 pounds—were counted crossing the road near Suffolk. Bears still may be found, as well as small deer, but hunters today consider themselves lucky to see a deer, let alone to bring one home.

You can have your choice of smaller game such as wildcat, raccoon, cottontail rabbit and several varieties of squirrel. The famous wild cattle that roamed the swamp 25 years ago have largely disappeared. Actually, they were domesticated animals that had strayed from their owners.

The expensive mink coat that decorates the window of a Fifth Avenue shop may be made of skins collected in the heart of the swamp. A few years ago there were as many as 100 trappers engaged there during the winter months. Mink and raccoon were caught in large numbers, although three racoons were caught for every mink. The decline in popularity of the raccoon coat caused a drop in prices paid for the skins. Trappers complain that they cannot make enough money catching mink alone since the animal is wary and hard to take. Consequently, there are not more than half a dozen trappers in the entire area this winter.

The long-standing proposal to convert the Lake Drummond region into a recreation area invariably enjoys its annual acceleration with the advent of summer heat. This flurry of enthusiasm, however, suffers relapse upon the arrival of cooler weather. Before the war a launch made frequent trips with tourists down the Dismal Swamp Canal to the Feeder Ditch and thence up to the lake. A hotel was built on the shores of the lake a quarter of a century ago, but failed after the first summer. This was a distinct victory for the biting, stinging yellow fly which reigns absolute in the swamp during the summer. Even the hardened swamper who skillfully parries a rattler or thrusts a cottonmouth concedes the swamp to the fly without challenge. With good judgment he retires beyond the swamp limits until the seasonal reign of the pest expires.

There are enough fish in the lake and the canals to gladden the heart of any angler. The ones most commonly caught include several varieties of perch, bass, catfish and pike.

Repeated effort has been made through the years to have the Great Dismal Swamp set aside as a national forest. Just recently the proposal was submitted to a conference of eastern national forest supervisors.

The Virginia Game Commission is hopeful that at least parts of the

swamp will be set aside under national supervision. The argument is made that the coastal area has no public hunting grounds similar to the one and a half million acres in the mountainous section of the state. The Izaak Walton League has been urging federal acquisition of the swamp for national forest development for several years.

Important as the recreational features might be, the real value of the swamp lies in its great timber resources. A large section still stands rich in timber although thousands of acres have been cut over by lumbermen. Furthermore, vast tracts have been burned by fires that occur during the summer months. Only last year a single fire accounted for the devastation of 800 acres.

Once started, fires are exceedingly difficult to control since roads in the swamp are few and passage over the bog is next to impossible. For this reason a fire that worked its way into the peat beds in 1923 was not extinguished for three years. Ordinarily, air that is only slightly permeated with peat smoke is not particularly objectionable. Smoke from the Great Dismal Swamp fires, however, is often so thick that motorists in the adjacent area turn on their headlights during the daylight hours. Main highways are sometimes completely closed to traffic. (Special fire prevention and control measures were instituted during the war to prevent the smoke from this area interfering with military aviation training schedules and with submarine patrols flying off the Virginia coast.—Editor's Note.)

Adequate fire protection for this area is too expensive a project for either of the two states to assume. It is agreed that it is a task for the federal government.

The Great Dismal Swamp has been described as one of the wonders of the world. Certainly it has no parallel for paludal land elsewhere in the United States. There are hundreds of acres where the brown water is hip deep. The spongy earth underneath, however, is not the "quicksands" reported by many writers who romance in swamp legends with slight regard for the facts. Instead, it consists of layer upon layer of decaying vegetable matter. The novice finds it almost impossible to travel through the swamp on foot because of the insecure footing.

Thousands of years of decaying plant life have filled the soil with rich humus. The resulting fertility combined with the excessive moisture accounts for much of the lush growth that has always been a characteristic of the swamp. Explorer Byrd wrote of the "perpetual verdure" that delighted the eye.

The most valuable trees for lumbering purposes are found in the most inaccessible area. This section is locally referred to as the "deep swamp." Here is the picturesque and valuable cypress with its conic root projections called "knees."

A green cypress log is so heavy it will not float. Before the introduction of a logging railroad into the swamp, lumbermen would kill a tree by girdling it and chop it down the following year when it had dried out.

Three varieties of gum are found in the deep swamp — sweetgum, blackgum and water tupelo. Sweetgum is often called red gum from the color of its heartwood. Since the leaf is a five-pointed star, it is also called star-leaved gum.

The most valuable tree in the swamp is the falsecypress, known to lumbermen as southern white cedar, and locally as juniper. It is an even more versatile tree than the cypress, the wood being converted to a thousand uses from shingles to boat planking. The juniper often takes entire possession of a swamp area by crowding out all other trees. These pure stands are called juniper bays.

While the deep swamp produces

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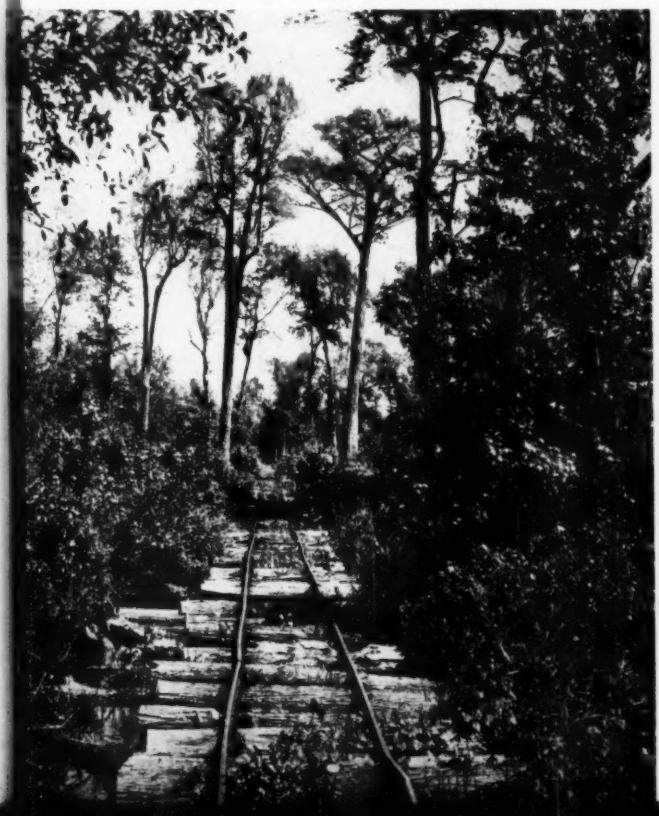
Most valuable timber is in the "deep swamp" where the railroad practically floats on water



Logging train passing through swamp border belt —today mostly shrubs and less valuable trees

THEY WANTED Mahogany

By EDWARD R. PLUMMER

Uncomfortable days in the jungle, saddle burns and an ancient disease, but mahogany doesn't come on silver trays — our fighting forces needed it and they got it

AFTER Pearl Harbor, mahogany hunters were alerted in the Gold and Ivory Coasts of West Africa. Along the Amazon Valley in Peru and Brazil they began to gather supplies. In Mexico, in British Honduras, and in the republics of Central America, they looked expectantly to Washington.

The Army and the Navy needed wood for planes, gliders, PT boats and other small craft. They wanted a wood that was strong but fairly light, straight grained, stable, large in size and uniform in texture. Chiefs of the armed services studied the reports of exhaustive tests. They asked for mahogany.

They asked for tens of millions of feet more than had ever been imported to this country in a similar period. The Foreign Economic Administration, in charge of foreign procurement, began to write contracts with the old, established mahogany importers. These were not enough. Other companies, less experienced in the tropics or in logging, were commissioned to get what mahogany they could provided they seemed to have a reasonable chance of success. In a few such cases, the government lent financial assistance.

Through the State Department, agreements were made with the respective foreign governments. Logging equipment and sawmill machinery were sent to American seaports, consigned to tropical coasts and forests. War Shipping Administration began to allocate boats to pick up mahogany cargoes in protected ports. But enemy submarines were moving into the Gulf, the Caribbean and the South Atlantic.

Finally the FEA sent down a handful of wonder boys, of whom I was one, to stimulate the production of mahogany in Mexico, British Honduras and Central America. The Civil Service Commission, reaching blindly into a hat, came forth with the title of "forestry specialist" and presented it to each of us with a solemn bow. I looked at mine with a jaundiced eye. It was true that I had explored tropical forests before, but never with any great enthusiasm. The best way to cruise the bush is from the air, I had discovered; not by hacking trails through the stifling jungle. I determined to leave the back country severely alone as long as possible.

They sent me first to Bluefields, on the Caribbean Coast of Nicaragua. Three American companies had headquarters there, and two of them had sawmills. A third mill was being erected with the help of the American government. For the next few months, on both coasts of the republic, I inspected logs and lumber. Lumber presented no difficulties; its grades are well established. In the case of logs, however, inspection is apt to be a profane and quarrelsome affair. Twice I slid off loose logs into the lagoon while passionately trying to prove my point that a certain log was not suitable for war uses.

Swirly or twisted grained logs could not be accepted. Straight splits had to be discounted half the length of the split; star splits, the entire length of the split. The depth of the penetration of pin worm holes and surface rot was subtracted from the diameter of the log, small end. If *comejen* (white ants) holes appeared at one end, half the length of the log was deducted; if they appeared again in the log, the entire log was rejected.

The result in footage of acceptable logs was disappointing. The spring and fall floods, for the first time in years, had been too light to carry many of the logs down the rivers to the coast. Thousands still remained in the bush, the creeks, or the rivers. I sent a gloomy report to Washington.

The blow fell at once. Washington replied through the embassy at Managua. I was to proceed without delay to the jungle, locate and in-

spect every missing log, estimate the outturn in specification lumber, and make a full report. They estimated that the entire trip would take six days.

Six days! I counted ten slowly in my remarkable Spanish. The river travel alone would require six days. The logs were scattered in three rivers, eight streams, and a dozen camps. The trip as outlined would take four months. I wired the embassy to that effect. I would, I said, proceed without delay to make spot checks of the location and condition of part of the logs, and also a test cruise of the standing timber. If I concluded that the mahogany contract should not be extended, I would so advise Washington. The trip would take from three to four weeks.

Most of the missing logs belonged to the company of which the British vice-consul, Frank Fleming, was the local manager. I gave him the gist of my instructions and told him that I intended to leave at once. He shook me warmly by the hand and grinned with pure delight. I was most fortunate to be permitted to return to the bush which I loved so well and enjoy a happy and healthy life in those beautiful but primitive surroundings. He regretted only that he could not accompany me, but, alas, other duties prevented.

I replied that I, too, was disappointed that he could not join me. I was unfamiliar with the territory where a million feet of his alleged logs were supposed to be lying. If I missed half a million feet or so of these logs, I would have to report to Washington that I could not find them. Washington would then demand of him what he meant by making false and fantastic claims. If the American government representative, a forestry specialist, could not find these logs, it would be safe to assume that no such logs ever existed.

He pondered this statement for a moment or two, and then sighed deeply. Very well. As a lifelong friend of three or four months standing, he would go with me. He would even lead me personally by the hand to every log in the bush. Such a trip would take at least six months and might well last a lifetime. He was younger than I by four years and would certainly outlive me. When I finally succumbed to the horrors of the bush and to a complication of tropical diseases, he would give me decent burial on a river bank high above the flood level. It would be a pleasure, he assured me.

A tug was ordered to pick us up that evening for the first stage of our journey. Supplies were bought from local Chinese, Russian and Syrian merchants. Anti-venom sera and first-aid kits were checked. Julio Pineda, who had been in charge of the mahogany camps the year before, was told to meet us at Rama as chief guide. We wired El Recreo to have two boatmen waiting for us there with a dory, as the river from that point on was too shallow for the tug.

Fleming asked if I had saddlebags. I shuddered violently. Better keep that kind of language out of our wholesome conversation, I warned him. The bush was bad enough without adding the torture of horses. Bush horses were not animals, anyway; they were cold-blooded reptiles. They were always plunging into thorns, or rolling into creeks, or trying to knock you off against

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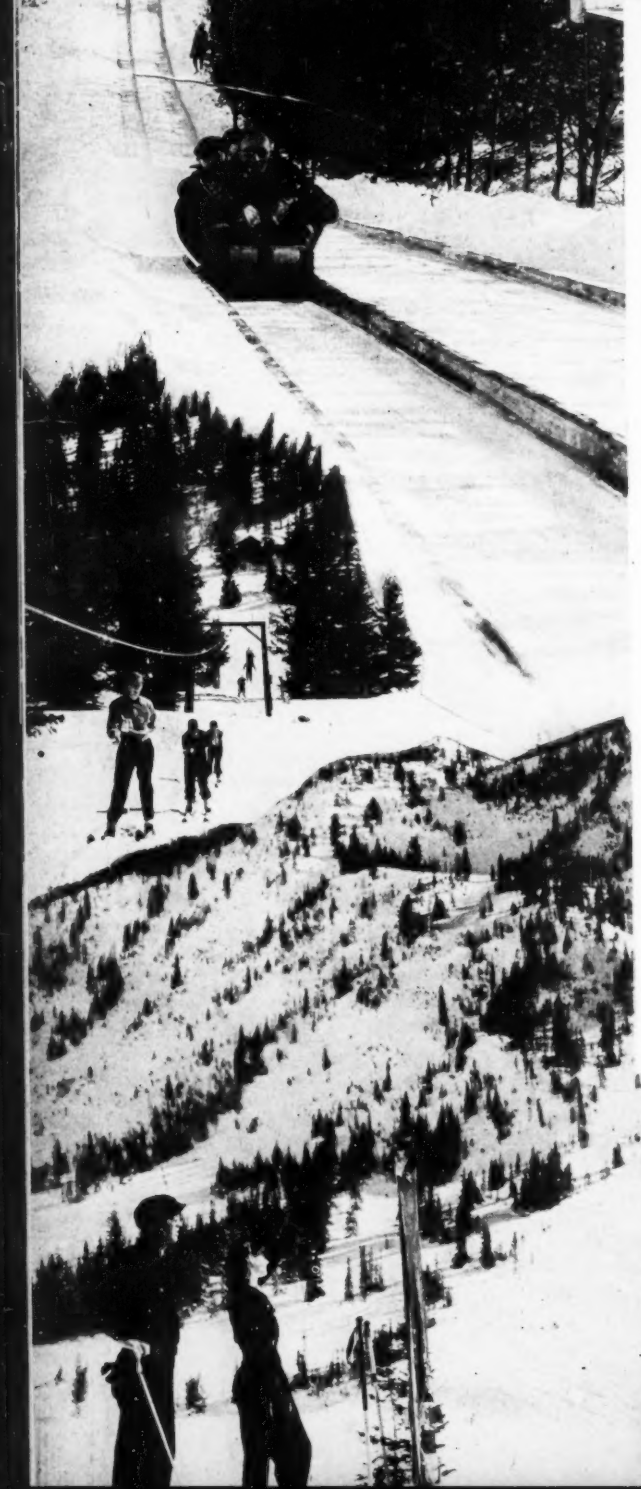
Spring and fall floods, for the first time in years, had been too light to carry the logs down to the coast—thousands remained in the rivers

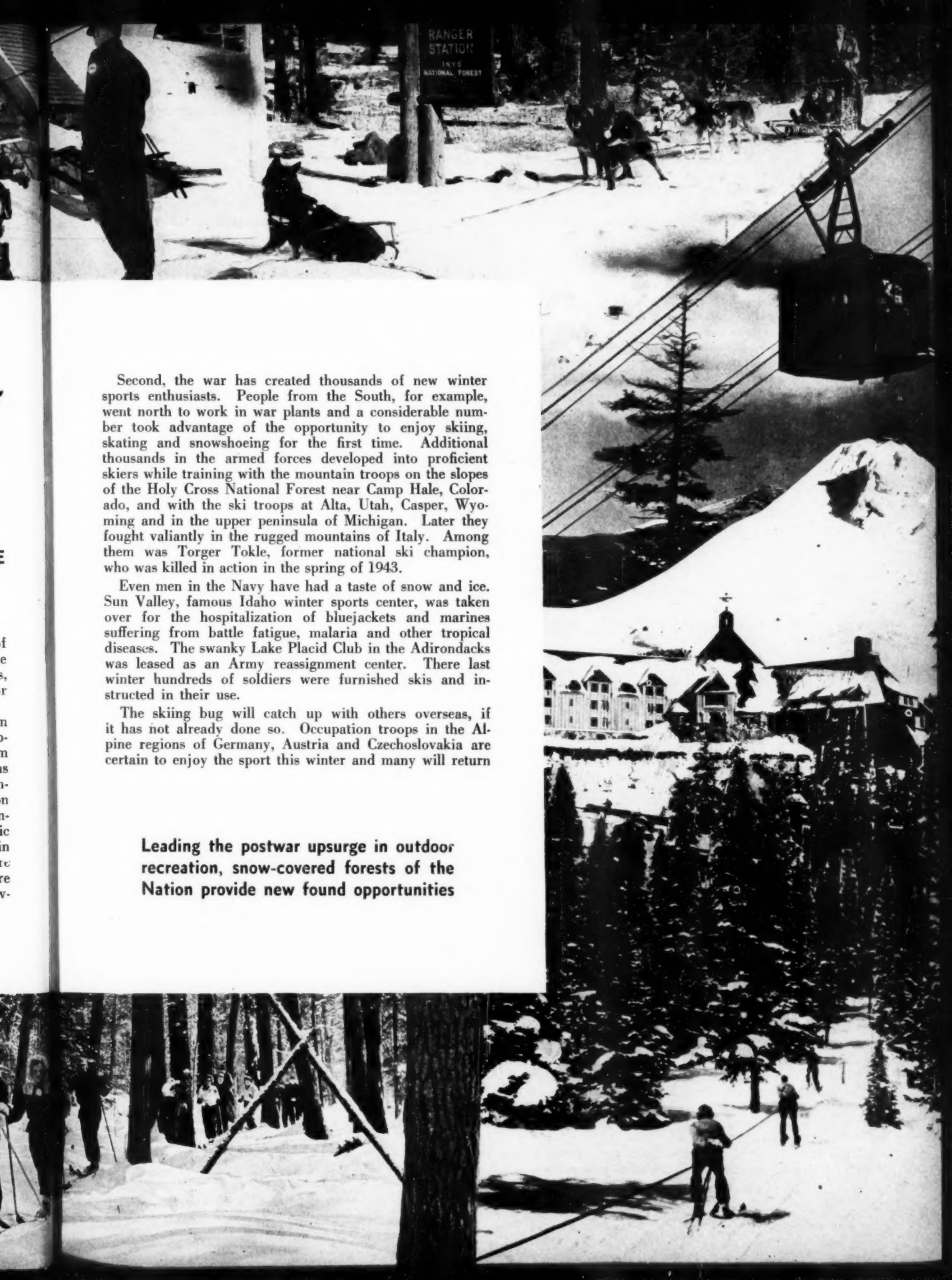
FORESTS FOR *Winter Sports*

By WILLIAM J. DUCHAINE

NOW that the war is over, all signs point to one of the greatest recreation booms in the history of the nation. This is particularly true of winter sports, which ascended in popularity by leaps and bounds prior to Pearl Harbor. There are several reasons for this.

First, largely due to the prewar Civilian Conservation Corps program, winter sports facilities have been developed in national forests throughout the "snow belt" from New England to the Pacific Coast. The White Mountains in New Hampshire, Mount Valhalla in northern Wisconsin, Romantic Alta in Utah, and Timberline Lodge on Mount Hood in Oregon, are outstanding examples of winter recreational areas developed by the CCC on public lands for the enjoyment of Americans seeking thrills in skiing, skating and snowshoeing. Of course, there are many other areas, large and small, some of which were left unfinished when the CCC boys threw down their shovels and shouldered guns.





Second, the war has created thousands of new winter sports enthusiasts. People from the South, for example, went north to work in war plants and a considerable number took advantage of the opportunity to enjoy skiing, skating and snowshoeing for the first time. Additional thousands in the armed forces developed into proficient skiers while training with the mountain troops on the slopes of the Holy Cross National Forest near Camp Hale, Colorado, and with the ski troops at Alta, Utah, Casper, Wyoming and in the upper peninsula of Michigan. Later they fought valiantly in the rugged mountains of Italy. Among them was Torger Tokle, former national ski champion, who was killed in action in the spring of 1943.

Even men in the Navy have had a taste of snow and ice. Sun Valley, famous Idaho winter sports center, was taken over for the hospitalization of bluejackets and marines suffering from battle fatigue, malaria and other tropical diseases. The swanky Lake Placid Club in the Adirondacks was leased as an Army reassignment center. There last winter hundreds of soldiers were furnished skis and instructed in their use.

The skiing bug will catch up with others overseas, if it has not already done so. Occupation troops in the Alpine regions of Germany, Austria and Czechoslovakia are certain to enjoy the sport this winter and many will return

Leading the postwar upsurge in outdoor recreation, snow-covered forests of the Nation provide new found opportunities

home expert in backward somersault, Christie and other intricate movements.

Roger Langley of Barre, Massachusetts, president of the National Ski Association, believes many returning veterans will find employment as ski instructors. Before the war Austrians, Swiss and other foreign instructors dominated the profession, but it is predicted that now American-born skiers will conduct the ski schools opening up throughout the snow regions.

In national forests from New England to the Pacific—even in far-north Alaska—the U. S. Forest Service maintains 254 winter sports areas. At the outset of the nation's entry into the war, however, all recreational activities, particularly with respect to development of new facilities were curtailed drastically in all of the national forests. Developments for recreation were limited to those adjacent or near to cities and towns with heavy war populations, where such facilities were considered essential for war workers and Army personnel.

In 1941, more than a million and a half visits were made to the national forests for participation in winter sports. This figure dropped to 300 thousand in 1944 because of restrictions on tires and gasoline and decreased leisure time. That it will be greatly accelerated—even beyond the prewar figure—in the years immediately ahead is taken for granted by winter sports authorities.

Perhaps the outstanding winter sports development by the Forest Service is Timberline Lodge in the Mt. Hood National Forest of Oregon. It also has made extensive developments on Bald Mountain in Idaho's Sawtooth National Forest, augmenting the facilities of Sun Valley; the Highway 40 and Lake Arrowhead areas in the Tahoe and San Bernardino national forests in California; Berthoud Pass and Winter Park in the Arapaho National Forest of Colorado; Caberfae in the Manistee Forest of Michigan; Pinkham Notch in the White Mountain Forest of New Hampshire; Alta in the Wasatch and Snow Basin in the Cache National Forests of Utah; and Heather Meadows, Snoqualmie Pass and Snoqualmie Ski Bowl areas in the state of Washington.

Big news for Colorado winter sports boosters was the recent transfer to the Forest Service of the mammoth ski tow used by the Army for the training of mountain troops at Camp Hale. The lift is 6,000 feet long and has a rise of 1,100 feet. It is expected that the tow will be operated this winter by a Forest Service permittee. Overnight accommodations may also be provided if use of some of the vacated Army buildings is deemed practicable.

The mountain slopes in the Wasatch and Cache national forests, which offer unexcelled skiing eight months out of the year, are turning the spotlight on Utah. A mile long chair-lift has been installed at Snow Basin, 18 miles east of Logan, and another tow was added last winter to the facilities provided by the Forest Service at Alta, 29 miles southeast of Salt Lake City.

Publicized widely already as Romantic Alta, this revived ghost mining camp has been rated by President Langley of the National Ski Association as one of the most promising winter sports centers in the country.

Sun Valley had its Steve Hannagan, but Romantic Alta has its "Mayor" George H. Watson, a natural-born promoter and publicist, who envisions that some day the glistening snow crystals will mean more than the $34,000,000 worth of silver, lead, gold and other minerals mined during Alta's mining boom days.

Alta bound, one leaves Salt Lake City and travels over a broad, paved highway some 19 miles to the mouth of Little Cottonwood Canyon, and then about eight miles up the canyon to the Alta Ski Lodge, 8,585 feet above sea level. From this point the visitor has a view of mountain scenery that rivals in grandeur that of the Alps. A little over a mile to the west, on the north side of the road, is majestic Superior Peak—elevation at its ridge 11,030 feet. Three-quarters of a mile to the north and a little to the west is Flagstaff Mountain, whose ridge is around 10,500 feet above sea level. About the same distance beyond Flagstaff is the well known Cardiff Mine.

Alta is fortunate in having mild slopes for beginners and a wide range of long steep slopes for experienced skiers. From the highway, a mild slope drops about 100 feet to Little Cottonwood Creek in the bottom of the canyon. A rope tow serves the portion of this slope which is used chiefly by beginners.

South of Little Cottonwood Creek are the main skiing slopes. On the lower north slopes of Rustler Mountain are two rope tows and a new chain-lift. This is 700 feet long and elevates the rider some 300 feet vertically. For those who wish to run the longest and steepest slopes several course are open. The giant chair-lift has its lowest terminal at an elevation of about 8,600 feet and runs up the slope just west of Collins Gulch for 2,700 feet to an elevation of 9,300 feet.

Between the upper terminal of the giant lift and Mt. Baldy, elevation 11,069 feet, is the area called the "upper basin". From a point some 400 yards south of the upper terminal of the giant lift is another chair-lift. This runs to the west up the slope to a point on the divide between Collins Gulch and Peruvian Gulch.

It is called the Peruvian lift. Its lower terminal, at an elevation of 9,250 feet, is almost in the bottom of Collins Gulch, which flattens out into a wide basin at this point. The lift rises to an elevation of 9,650 feet on the ridge overlooking Peruvian Gulch. At this point the skier has a magnificent view of the rugged mountain peaks and narrow deep gulches for almost a full circle around the horizon.

For those who make the ski run down Collins Gulch, it will be of interest that they pass above many mine workings.

Romantic Alta will need more housing for winter sports tourists now that the war is over, as Alta Lodge has overnight accommodations for only 60 guests, and Snow Pine Lodge can take care of only 20. Even in wartime, rooms were booked months ahead.

Soldiers from all sections of the country trained with the ski troops at Alta. Hollywood cameramen have filmed many movie scenes there, and still pictures of skiers swooping down the mountain slopes have appeared in many magazines and newspapers. Since the new highway was completed several years ago, it is estimated more than 500 thousand skiers have gone for a taste of Alta's fine powdered snow. Globe-skiing winter sports fans predict the area will be another Sun Valley. To this, "Mayor" Watson might be inclined to say, "Where's Sun Valley?" were he not so imbued with the philosophy of the spacious West—"live and let live."

Rare Walking Sticks

CATALOGUE items can be dry as dust. But out of the catalogue of a unique collection that seems to suggest the steamy depths of jungle forest, remote unexplored wilderness "down under," and old world market places comes this item:

"Zanahy *(Nauclea cuspidata* Baker; *Rubiaceae)*. Madagascar. Quebracho blanco handle with shagreen, ivory and gold inlay; gold band."

It is item No. 1269 of the Rudolph Block collection of walking sticks.

When the late Rudolph Block, better known as Bruno Lessing, author and columnist, began to collect rare woods from the distant places he travelled, he could not foresee that one day the collection, famous and unique, would include 950 named species of the world's most interesting woods. Fashioned into 1,400 walking sticks, as a medium to present the varieties and beauties of these woods, the collection has been on exhibit at intervals during the past 16 years at the National Museum in Washington, the New York Botanical Garden and Yale University.

Primarily, it is a collection of scientifically classified woods, rather than an assembly of canes. In having the crude lengths of wood finished into canes, it was the collector's desire to provide the perfect medium for artistic expression. He sought out skilled craftsmen in wood, metal and stone not only in this country but in Europe, who followed his designs and instructions for creating a beautiful museum piece of each stick—and one that is classified with scientific accuracy.

Gathered from far and near, the 1,400 sticks represent 950 named species and about 550 different genera. They include 11 woods not identifiable, and 16 to which only family names could be given. Concerning woods duplicated in several canes, Mr. Block has pointed out, "Where two or more specimens of the same wood find a place in the collection it is only because of some idiosyncrasy of color, figure, or other quality that is characteristic of the varieties of this wood."

Many of the specimens came from lumber dealers, but many more came from foresters, explorers and "friends, acquaintances and random correspondents in all parts of the world."

It was this widespread interest in the undertaking that prompted Rudolph Block to have a first catalogue printed in 1925, listing 200 sticks. Just how far-reaching was the influence of the collection, was recounted in the collector's famous column *Vagabondia*, on April 8, 1939. He referred to the time when Harvey S. Firestone had just purchased a million acres of land in Liberia for planting rubber. Clearing the land meant cutting virgin forest and destroying it.

"Mr. Firestone—a perfect stranger to me—happened to be in New York and I telephoned him and asked if he wouldn't like to see some beautiful woods. To my amazement he showed up in my apartment in an hour. He was delighted with the specimens I showed him. I said, 'Look here. While you're cutting down all those trees why don't you get a scientist to study them? Maybe some new woods will be found that will be helpful to the world.' He said, 'Get me a scientist, and I'll pay all expenses.' "

That conversation laid the foundation for the formation of the International Association of Wood Anatomists and the study of Liberian timbers. For Mr. Block introduced Harvey Firestone to Samuel J. Record, late dean of the Yale School of Forestry, who shared the collector's interest in strange woods. A man was sent to Liberia, where a half dozen species then unknown to science were discovered. It proved necessary for Mr. Record to go to London to enlist help for identification of these unknown woods; his idea of exchanging wood specimens on an international basis was thus born and the organization was formed.

A second catalogue was printed in 1926 containing 700 walking sticks, and the present catalogue appeared in 1928, with its 1,400 specimens. The need developed early for a forester to identify the woods as accurately as possible, and it became Mr. Record's task to determine the specimens. Particularly difficult problems were finally submitted to specialists who could make comparisons with authentic samples. In several instances, this intensive research served to fix for the first time the botanical status

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By DOROTHEA SHEATS

In three years the author planted 20,000 trees in old fields. At left European larch four years after planting and at right the same plantation twelve years later. The trees are now forty feet high

A Forester's Forest

By DAVID B. COOK

His critics opined he was crazy. But this young forester, fresh out of Cornell, set about building a forest from 120 acres of worn-out fields and rundown woodlots

EVERY forester has, at some time in his career, aspired to possess a forest of his own, some place where he would be free to practice his private brand of silviculture, try out his own ideas of management. Too few foresters have had the opportunity to do so.

Long before I decided to take up forestry as a career, I had the desire to own a piece of woods. So it was natural that, having returned home from Cornell with a bachelor's degree in forestry, I should look about for some land to buy. I took counsel with my father, a practicing lawyer, and together we surveyed the problem. We discussed matters of distance, location and price. How far away from home could a forest be and still serve my purpose? Did I want good timber, or would I settle for abandoned farmland? If the latter, how about buildings? How much could I afford to pay? And, most important of all, where could I find the best timber-growing chance? These were important questions for a young man newly launched in his profession, but on correct answers depended much of ultimate success or failure.

After due consideration, we decided on the specifications. The place must not be more than 25 miles from Albany, New York, and it must be served by a public road. Price must not exceed $5 an acre for 100 acres. At this price, I would have to be satisfied with an old farm, but buildings would be no object. Although the location of the wooded sections was well known, no one could advise me as to where trees grew best, and growth, rather than present stand, was what interested me. And so, map in hand, I began a one-man, spare-time search for a bit of land.

I soon found that the best timber chances were in Rensselaer County, and there I concentrated my efforts. But my price was low for booming times and it required four years and several false starts before I found a place that reasonably met my needs and an owner who was disposed to sell. An abandoned farm on a back road, with dilapidated buildings, worn-out fields and hacked-over woodlots was nothing to stir the imagination. However, it did have possibilities. The land was, I knew, capable of growing superior timber. Past management had not destroyed the fertility of the soil. Markets were excellent and diversified. The set-up looked good, for the long pull if not for the immediate future. So I bought the place.

What I got was a typical abandoned farm, no better and no worse than thousands of others in the northeast. The 120 acres was a composite of two former farms and an adjoining woodlot; all of one and parts of two other of the original Van Rensselaer lots into which the town had been divided by the survey of 1789. One set of buildings had long since disappeared, leaving no trace but the old cellar hole. The other set was poor. The place had been going down hill for 20 years, had been out of cultivation for nine. A sorry-looking place it was, fast reverting to weeds and brush. But it met my specifications as to location and price and timber-producing ability.

My forest lies in the town of Stephentown, in the southeast corner of Rensselaer County, close to the Massachusetts line. By political accident it is in New York but, structurally and socially, it is part and parcel of New England. The Hudson River, 20 miles to the west, divides the twisted and split metamorphic rocks and rugged topography of New England from the unaltered sedimentary rocks and flat-topped profiles of the Allegheny Plateau.

In the remote Devonian Age, a great river had flowed out of what is now Vermont and poured its loads of sediment into a shallow sea extending far to the southwest. The landward end of the delta was a waste of greenish sand. Age after age, the deposits thickened, until the early beds were deeply buried. Later, the whole mass was heated, warped, squirted full of quartz and then lifted above the sea. Tons of erosion wore away stupendous thicknesses of overlying rock, cutting the land down to sea level and again exposing the old sandy delta, now turned into extremely hard rock. Another upheaval pushed the land up half a mile, and again erosion took up the timeless task of wearing it down. All that now remains of the old delta of sand, mud and pebbles is the Grit Plateau, the geologically famous graywacke of Rensselaer.

This tableland, with its top elevations above 2,000 feet, "lies like a turtle on a beach" among the surrounding lowland, a 10 by 20 mile oval of rough, rugged, thinly settled mountain land in the midst of rich and densely populated valleys. Because it rises abruptly along the lee margin of the broad Hudson valley, the plateau has abundant rain (almost 45 inches), high atmospheric humidity and plenty of snow. Springs, ponds and brooks are everywhere, and the land is aptly described as "well-watered." With reasonably fertile but acid soil and abundant moisture, trees and shrubs grow vigorously. The forest is aggressive, quickly reclaiming any bit of land left untended. On the higher sections, red spruce, balsam fir and paper birch give the forest a definitely northern aspect. At lower elevations (my forest lies between 1,250 and 1,400 feet) the woods are of hemlock and pine, of maple, ash and oak. Old fields revert to gray birch and aspen.

The first white settler in the section was Asa Douglas, who came in 1766. Within two decades, the Yankees had spread over half the county, cutting roads, building houses and sawmills. They cleared some of the forest to make plowland and pasture, but there was never the wanton destruction of timber that occurred further west. The woods were too important. Even at the height of agricultural development, half the land was in forest, and woods work was an important source of income. Then came improved transportation, and with it a shift from general farming to dairying, accompanied by abandonment of the less accessible farms. Before abandoning his land, the owner "mined" it of all that was salable. Finally departing, he left behind only run-down meadows, brushy pastures and cutover woods—the typical abandoned farm of the northeast.

Because such abandoned lands are often returned to timber production, their ownership and management are matters of concern to the forester. It is true that they have been stripped of most of their merchantable timber. Worn-out fields grow nothing better than brush. But the basic soil quality is there and they are relatively accessible. With time and patience, they can again grow timber, perhaps better timber than grew in the virgin forest. It would take skill and judgment and lots of hard work but it could be done. I set out to demonstrate.

My first task was to make an inventory. The meadows, mowed too long, must be planted up. Old pastures had seeded up to gray birch, aspen and some good hardwoods. Some could be converted; some would have to be left as they were. One woodlot, which had been closely cut for charcoal wood, was coming back to a dense growth of saplings. In the other woods there were too many trees of sprout origin, too many weeds, and too few conifers. The poor trees must be taken out. The only merchantable timber was a scattering of hemlock, left in the course of cordwood cutting, and a few scrubby pines. From these 120 acres of worn-out fields and rundown woodlots, I started to build a forester's forest.

The most pressing problem was to plant up the meadows and still-open pasture land to valuable conifers before it was taken over by brush. It was a merry race, with the odds against me. In three hectic years we planted 20,500 trees—white pine, red pine, white spruce, Norway spruce and larch. Two-thirds of the area I succeeded in planting, the rest I conceded to the brush.

A second task, worked on concurrently, was to convert brush and poor volunteer trees to conifers by clear-cutting and planting. Densely-stocked stands of gray birch and aspen are difficult to manage, for the birch often dies before reaching marketable size. Such jobs require careful planning, for the line between what pays and what doesn't is perilously thin, and one can lose one's shirt in a hurry. I have successfully converted about 15 acres and now have promising stands of spruce, red pine and larch where only weeds grew before.

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Birch on an old field being clear cut for charcoal wood. It will be replaced by spruce, pine, or larch

White spruce—planted on cutover hardwood land—grew up to twenty feet in sixteen years

By WILLIAM RUSH

WHEN ANIMALS GET SICK

Life in the wilds is not always conducive to robust health as evidenced by the multitudinous disease problems now confronting our game managers

WE think of the wild creatures of our mountains, deserts and seashores as paragons of health. Who would suspect a deer of being sick? Or a mountain sheep? Imagine a black bear skinny and cross because he needed worming, or a bison cow aborting her calf! Who would dream that antelope have bad teeth?

Yet all species of wild animals are afflicted with diseases of more or less seriousness.

One raw March day Ranger Trischman and I were snowshoeing up Yellowstone River in Wyoming. We saw a blacktailed deer that walked with a peculiar jerky gait. His spine instead of being a normal straight line was curved upward. He held his head down, instead of high as he normally would have done. We shot the animal and made a field autopsy. In the muscles of his legs and back were numerous grisly bodies about the size of a grain of wheat. These were cystic larvae, the progeny of a tapeworm found in coyotes.

The adult tapeworm lays its eggs in the coyote's intestines. Eggs pass out on the ground where in time they develop into motile larvae that migrate to blades of grass. When deer eat the grass the larvae develop further in the intestinal tract, then penetrate to the blood stream and lodge in muscle fibers. Here they encyst, that is, become covered with layers of tissue. When the deer is killed and eaten by coyotes the cyst covering is digested and the larvae liberated to develop into a mature tapeworm. The worm, now firmly ensconced in the coyote, produces more eggs and the cycle begins again.

Humans may become infested with cystic larvae by eating uncooked meats. One form of such a disease is trichinosis, in which the victim suffers greatly from stiff muscles, fever, sleeplessness and nausea.

From western Montana came reports of foot-rot disease in deer. This is a very serious disease of domestic sheep. It is caused by a bacterial parasite growing between the toes. If deer became infected they would tend to spread the bacteria far and wide. Stockmen would call for annihilation of all deer, as they did in California when the dread foot and mouth disease sneaked in from South America.

A ranger from Plains, Montana, brought in a set of deer feet that were swollen, ulcerated and with hoofs loosened. But it was not from bacterial infection! Careful dissection produced dozens of long, white, threadlike worms, some extended full length in the tissues, others coiled tightly just under the skin. The coiled ones had made punctures through the skin and these had developed into sores. They proved to be a new species and were given the name of *cervipedis*, or "deer-foot" worm. Later that same winter several hundred deer feet were examined at Plains. More than half were infested with foot worm.

Ranchers from the Thompson River country of Montana report that foot disease is so severe some winters that deer cannot run at all through crusted snow and coyotes find them easy prey.

In humans, subcutaneous thread worms cause such diseases as elephantiasis, loiasis and dracontiasis, all of them common in tropical countries.

Deer have many other afflictions. Liver fluke infestation is perhaps the most peculiar. Adult liver flukes are flat worms about an inch wide and nearly two inches long. The larvae, almost microscopic in size, are ingested with grass and other herbage, gain access to the abdominal cavity and puncture the liver. At first the deer becomes very fat—because the parasites set up a pronounced irritation of the liver which stimulates the production of bile. The function of bile is to emulsify and prepare for assimilation fat from the food eaten. The more bile, the more digestible fat. Meanwhile, the liver is disintegrating under the action of the developing parasites and at a certain point bile production falls off, the deer becomes poor and in extreme cases dies.

Deer also have lung worm infestations that often result seriously. They have tapeworms and round worms and are host to wood ticks, lice and tick flies. Worst of all is the deer bot-fly infestation.

I watched a big blacktail deer die of this disease. She staggered backward, fell down, got up again, turned in circles, fell and did not get up. Autopsy revealed about fifty grubs, each more than an inch in length, a quarter of an inch in diameter and covered with sharp, horny spines. These were fastened in the gutteral pouch, sinuses and nasal passages. Some of the grubs were lodged within a fraction of an inch of the brain. The throat, nares and adjacent parts of the head were highly inflamed, a veritable hotbed for bacterial infections.

Some of the mature grubs were collected and put under loose soil in a jar to incubate. In time I was rewarded with several large black flies. Experts in Washington, D. C. identified them as *Cephenomyia pratti*, or Pratt's headfly.

I had often noticed blacktailed deer standing belly deep in water and more than once had seen them duck their noses under. They were protecting themselves against the attack of *Cephenomyia*. The bot-fly does not lay eggs as do most insects, but bears its larvae alive and it does not need to alight on a deer's nose to plant the larvae. It hovers close and literally squirts them into the deer's nostrils.

I have one of those tiny larvae mounted on a microscopic

Infested with broad tapeworm this bear is ready to take the kamala "candy" treatment

A victim of pneumonia, one of the diseases which has almost wiped out the mountain sheep

slide. It is about one thirty-second of an inch long and was taken from a deer's head in October after it had been growing since August. The larva has hooks for attachment and migration into the sinuses where it develops during the winter. In April it is an inch long and attached to the membranes in a pocket at the base of the tongue. In May it loosens and is coughed out on the ground where it bores into the soil to emerge later as *Cephenomyia.*

According to one authority, *Cephenomyia* is the fastest animal in the world. The male can fly 1200 feet a second, faster than some of the old black powder bullets. The speed of sound is little more than 1000 feet a second. The female is slower than the male. She can go only 900 feet a second. No wonder a poor deer dips his nose in water when he hears one of those larvae-shooting females darting about.

Of all the animals which one would think lived in healthful surroundings our mountain sheep should take first rank. However, they are afflicted with ailments, which have all but wiped them out. The worst of these is pneumonia.

I kept close track of a big ram in Yellowstone National Park one winter. He was in poor shape and coughed a great deal but lived through to springtime. All other sheep trailed off to high country but this fellow couldn't make it. He was so feeble he could scarcely stand when I collected him as a study specimen.

A research veterinarian was called in to participate in the post mortem examination. The ram's lungs were highly inflamed and we searched the air passages for specimens of lung worms, but found none.

"Gather up froth from a bronchial tube and put it under your low power microscope," the veterinarian said.

The froth settled into a liquid which fairly teemed with larvae of lung worm. There were thousands of them. The adult worms had been coughed out but there were plenty of larvae left to carry on.

Another form of pneumonia is bacterial. In 1925, the Sun River mountain sheep herd was decimated by an epidemic of bacterial pneumonia. Other herds in the Rocky Mountains were likewise almost exterminated.

Scabies is a grave ailment in a great many animals, both mammals and birds. Chickens have mites, people have chiggers, horses and dogs have mange. Both domestic and mountain sheep are hosts to an extremely obnoxious scab mite. It is identical as far as form is concerned, on both wild and domesticated sheep. Nearly all wild sheep are infested and it is only through persistent treatment that tame herds are kept free.

Mites work on the surface of the skin, create sores and denude the hair. When a large part of a sheep's back is bare it dies of exposure just as a person might if he were forced to live outdoors during a severe winter without clothing or blankets.

Pneumonia and scabies have practically sealed the doom of mountain sheep in the United States.

The bison is a rugged individual yet he is susceptible to *hemorrhagic septicemia.* This is a bacterial disease which is highly fatal to American buffalo. The largest herd in the United States is in Yellowstone Park. Serious losses have occurred in this herd several times in the past 25 years. The disease strikes quickly and runs its course in a few days.

Yellowstone Kelley in his book of that name mentions the "black death" that left the plains of Montana covered with the bodies of dead buffalo. His account is brief. "The cause of their death was a mystery to us—." He, of course, did not know about *hemmorhagic septicemia* in 1870.

Was it really hunters who decimated the great buffalo herds, or was it "black death"?

A disease that very seriously affects increase in herd numbers is Bangs disease, or contagious abortion. This is quite prevalent in buffalo. Of 110 animals tested in the Yellowstone herd in 1931 about 53 percent were infected. The bacterial infection sets up inflammation in the lining of the uterus to such an extent that abortion results.

Of interest here is the fact that undulant fever of humans is caused by this same bacterium.

But of all the tough outdoor animals to be sick the hard-boiled, devil-may-care black bear takes first prize. He gets wormy—not one or two ordinary flat or round worms in his stomach, but intestines full of them.

"I've got to kill a dangerous black bear," said Ranger LaNoue one August morning. "He's in the live trap down by the stables."

It was a small black fellow about three years old but with a mean disposition more fitting to a 20-year-old bear. He growled, snapped his teeth and rushed to our end of the trap to strike at us with a wicked paw. His eyes literally sparked meanness.

I poked a stick through the bars at him. He grabbed it in his mouth with a snarl, crushed it viciously between sharp teeth and tramped it with a front foot. He was emaciated instead of roly-poly fat like the other bears.

I began to unwrap some of my own especially concocted bear sweets from waxed paper. "We'll give him some candy and see if it will improve his temper," I said.

My candy was made of honey, cocoa butter and powdered sugar. It also was about half kamala, a brick red, tasteless and odorless but very powerful medicine. The cranky fellow gobbled down all I gave him.

"Wait until tomorrow before you shoot him," I said.

Next day our Bruin was positively a changed bear. He grinned at us with lolling tongue and his eyes had a good natured twinkle in them. The reason was plain. In the bottom of the cage were dozens of tapeworms that the kamala had driven from his system. No wonder he had been miserable with that load of parasites in his intestines. We let him live.

The parasite is commonly known as the broad tapeworm. Bears become infested by eating infected fish.

The life cycle of this worm is more romantic than that of the bear it inhabits. The adult tapeworm is attached by a sucker arrangement on its head to the lining of the bear's intestine. Nourishment is absorbed through its body covering from whatever the bear eats. All the parasite has to do is hang on and procreate. It is hermaphroditic and from each adult millions of fertile eggs pass to the outside world. Some of them get into water where they hatch in about 15 days and live as free animals moving about by means of hairlike propellers. If eaten by a certain species of Cyclops, a crayfishlike crustacean about a fourth of an inch long, they develop in 14 days to the pre-larval stage.

Along comes a trout and gobbles down Cyclops. It is digested. The larva, however, is liberated and in a few days burrows through the trout's intestine and into its muscles where it becomes encysted. It is put safely away for as long as the fish lives. But, if a bear eats the fish the larva is liberated once more from its prison and develops into an adult broad tapeworm in the bear's intestine, ready for an easy life as permanent star boarder.

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An American Oak is Liberated

By PFC. BEN M. HUEY

The old oak as seen by the liberating G.I.'s

WHEN American troops, on March 30, 1945, raced through Wabern, a little country village about 20 miles southwest of Kassel, Germany, they met an old "countryman." But neither the troops nor the old-timer recognized each other. The GI's were in a hurry —and the old "countryman," being a sturdy white oak, was speechless.

How did it get there? Who brought this tree from America? The answers as related by an old printer in Wabern who recalled printing the facts about the tree in a chronicle, make a rather interesting historical narrative. The books, however, were destroyed in the British retaliation-for-Coventry bombing of Kassel on October 23, 1943.

The story begins in another war, the American Revolution. It happened that King George III of England, needing reinforcements to battle the straight-shooting continentals hired 18,000 soldiers from his friend, Landgraf Frederick II von Hessen, sovereign of Kur-Hessen, then an independent province of Germany. Some of the 18,000 were professional troops but most of them were adventuresome young sons of Hessian farmers.

For selling his subjects to fight in a foreign war, Frederick II was dubbed "Seller of Souls" by the irate citizenry. While historians consider him an able ruler, his lavish court, patterned after the splendor of that of King Louis XIV of France, had impoverished him. In order to puff out his much-folded purse, he hired out his subjects.

According to a German history of Kur-Hessen, the first 7,400 Hessian soldiers to sail from Portsmouth, England, to America were professionals. The trip was described as "hard and perilous," lasting from May 6 to August 12, 1776. The troops suffered from disease, rats, heat and lack of food and water. Commanded by their own Generals von Heister and von Knyphausen, they "fought well," according to the German historian, in the battles of Flatbush, Fort Washington, Germantown and others.

Built by von Hessen in 1704, this ancient castle now serves as a college for the 3rd U. S. Infantry Division

After the Treaty of Versailles in 1783, about 3,000 Hessians remained in America to continue battles marital rather than martial, and the remainder set sail for their homeland. Frederick II was glad to welcome the returning men, for it is recorded they brought back a "rich war knowledge" from their battles in America. Also, the Landgraf was more than considerably delighted with the enrichment of his coffers which amounted to 21 million thalers. Roughly converting this to present dollars, the fee England paid for the 18,000 Hessians amounted to $50,000,000, or $2,800 a head. But England was not alone in paying for the German hirelings. America is still paying a yearly tribute for the "Hessian invasion." A little insect, the Hessian fly, which hitch-hiked the Atlantic in the soldiers' bedding, stayed on to make the annual collection in wheat, which adds up to some 17 million bushels annually.

The returning soldiers, then as now, picked up souvenirs and among those brought to Kur-Hessen were a number of potential seedling oak trees. These acorns were planted on the grounds of a castle in Wabern, and several trees resulted, of which only the one now remains. Lightning played a part in the death of the others.

The Wabern castle and the surrounding buildings and grounds are now in use as a college campus for the third

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FOREST RESOURCES OF ILLINOIS

By ROY C. BRUNDAGE and A. BIGLER CROW

This article previews the findings in Illinois of the Forest Resource Appraisal of The American Forestry Association. Other states will be similarly presented in coming issues.

ILLINOIS has nearly three and a half million acres of land which may be classed as forest. For a great agricultural state, with important industrial centers, it is not surprising that only 10 percent of its surface remains in such a category. Yet the fact that this woodland contains nine billion feet of merchantable sawtimber does excite wonder (a sawtimber tree is one nine inches DBH or larger, containing at least one eight-foot log of eight inches top diameter and 50 percent or more merchantable volume). One marvels that so much usable wood should be found standing on the stump so near to great consuming centers.

For there are considerable forest industries in this state. Most important are the so-called *secondary* industries, factories that make a host of things ranging from toys to furniture and fixtures, buying their raw materials as veneer, lumber, staves, handles and the like. Thirty thousand people are employed in such work. The *primary conversion* plants, meaning sawmills, veneer and stave plants, post and pole yards, feltwood (billets chipped for making into roofing paper) chippers and many other establishments engaged in working logs into usable shapes, employ from 4,000 to 6,000 workers according to demand and available timber.

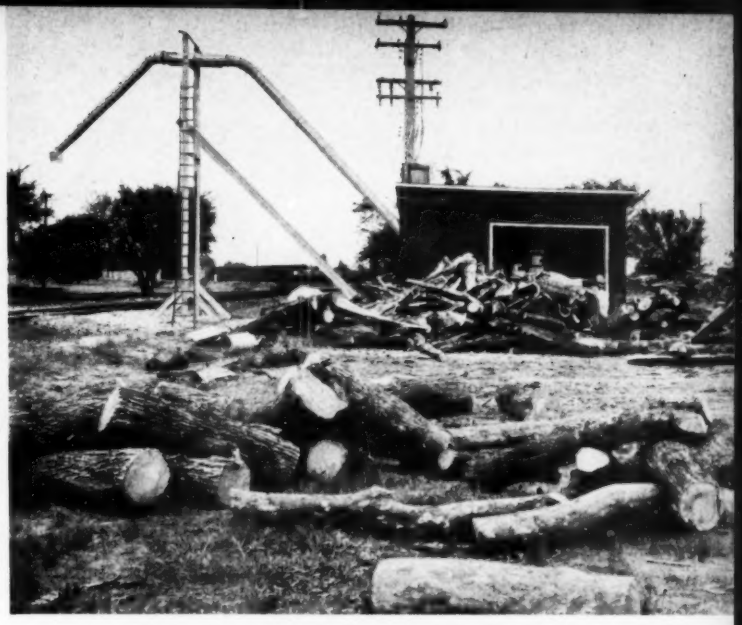
Sawmills and other primary units cut mostly Illinois trees, but nearly 95 percent of the wood used by factories and shops comes from outside the state. Practically all the softwood lumber that enters into construction throughout the state is likewise imported, since Illinois never boasted any considerable volumes of coniferous wood. Its story, then, must be written in terms of hardwoods—today's remnants of noble stands which once covered so much of its fertile surface.

Most of the secondary and wood-using industries require high quality lumber, veneer and dimensured hardwood (term adopted by Hardwood Dimension Manufacturing Association to describe semi-machined or machined dry hardwood as distinguished from rough hardwood lumber). Yet little of such material is being produced by local mills. In the northern part of the state much of the usable timber is in patches of a few acres each, and these have been heavily worked over for logs in the upper diameter classes. Also they are so closely grazed that not much younger material is

After careful selection and cutting this managed stand contains medium and small trees

A grazed woodlot logged for better quality trees in 1945. Few thrifty young trees remain

For the war many choice sycamore logs were found and made into veneers



Chipping plant at Havana, Illinois. Hardwood billets on their way to become roofing paper

coming in. Thus while trees are growing, they are mediocre in size and quality.

In southern Illinois it has been the practice to cut trees of small diameter for mining timbers and crossties. Inevitably such close utilization has greatly reduced the growing stock base for producing future stands of satisfactory quality. The large old growth was removed a generation or more ago; so immediately after World War I, many stave mills and other plants converting high-grade trees were forced by timber exhaustion to move elsewhere. While this exodus seriously affected the annual output of forest products, it also permitted partial recovery of the larger size classes by growth in the two decades that followed.

Thus it appears that the great bulk of timber which has escaped the ax and saw is of medium size and value, between the extremes of high-quality factory raw materials and small size mining timbers. However, during the period of the war emergency, as well as currently, a considerable volume of this medium size material is being converted.

During World War II, due to efforts of state and federal foresters in search of wood for Uncle Sam, many conversion plants reappeared in the state, thus setting the stage for a second cutting in these partially regrown stands. A thousand and forty sawmills, mostly small rigs cutting less than 500 thousand board feet a year, account for most of the primary sawing. There are a few stave mills and basket veneer plants, and a considerable volume of round timbers and ties are worked up by hand for use in the nearby deep mines.

Some of the tracts recently cut over have been handled conservatively, under skilled direction, and results point to a possibility of increasing yearly growth and yield by wider application of forestry principles.

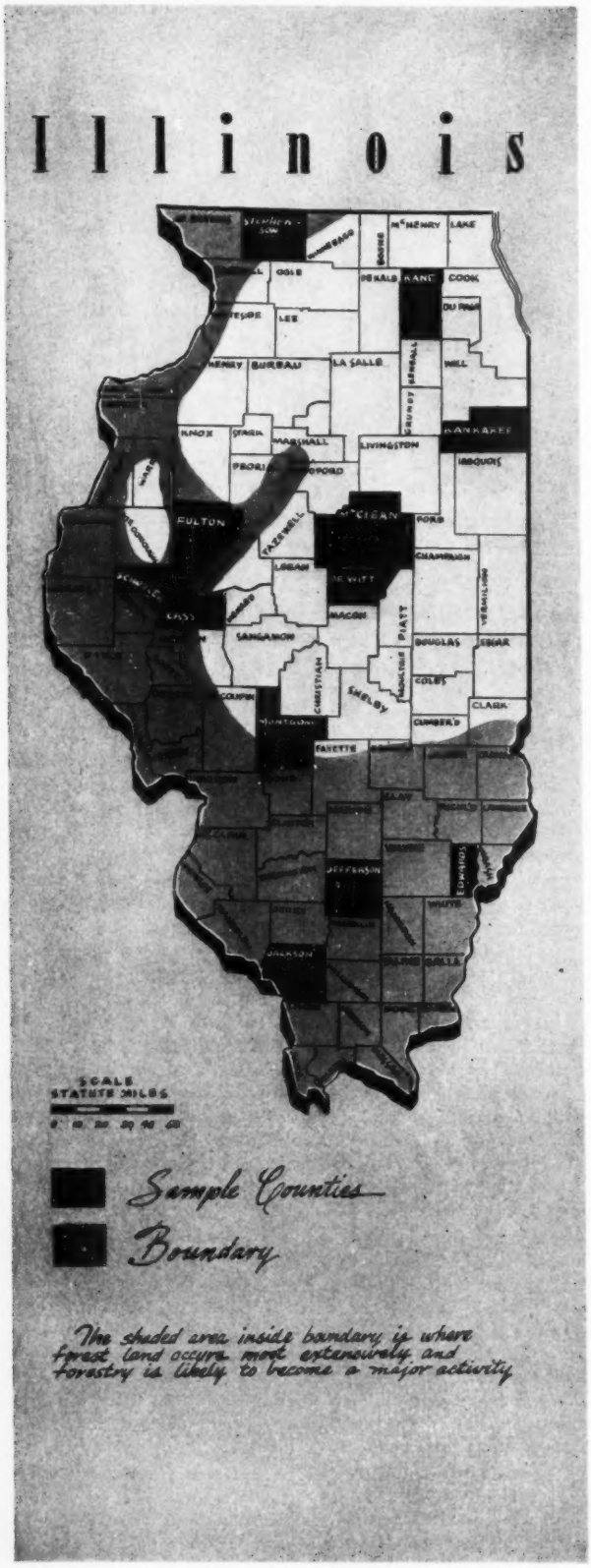
Normally, tree growth is rapid upon these fertile soils; yet it is not to be assumed that Illinois woodlands can support immediate expansion of industries demanding wood of high quality. First, time and wise management must join to provide a mature crop of suitable material, backed by a proper reserve of smaller growth of the desired species. There must be stands of less than sawtimber size (sawtimber stands are those containing minimum volumes of a thousand board feet an acre net scale, in trees nine inches DBH and up—minimum 25 percent crown density and minimum three-acre area) as well as those which are ready to harvest.

Unfortunately, much of current cutting is but a repetition of earlier high-grading or mining of the best material, regardless of the effect upon what is left. Locally, there is also cutting of extremely small sound trees of almost all species for use in the mines. Possibly the brightest side of the picture is that fuelwood cutting and the production of feltwood (made from chips of almost all local species) account for considerable removals of medium and large trees of inferior quality, thus permitting at least the beginnings of silvicultural improvement.

Comparison of current growth and drain reveals that an apparently unfavorable balance exists. Increase is estimated to be about 550 million board feet a year, while depletion stands at about 700 million board feet (expected drain for 1945 equivalent to 712,660,000 board feet, of which 238 million will come from sawtimber stands). If growth and drain are expressed in cubic feet, a unit more significant where small products are concerned, the annual increment is about 103,034,000 cubic feet, and the drain is slightly above 212,000,000 cubic feet each year. Such a comparison indicates a ratio of about two to one. However, this drain estimate includes 78,000,000 cubic feet of cordwood, much of which comes from cull trees or other salvage. So, the ratio actually is about that indicated by the board measure figures above.

The yearly drain from sawtimber stands is made up of lumber (120 million board feet), mine timbers (68 million feet), veneers (20 million feet), cooperage (16 million feet), and other products, including crossties, poles and piling (14 million feet). Considerably greater is the annual cut of fuelwood (390 million board feet or 650 thousand cords), while fence posts amount to 60 million board feet or 100 thousand cords. Pulpwood and feltwood account for 10 million board feet, while chemical wood adds five million to the overall total.

In setting out to estimate the stand of timber, the appraisers recognized two forest cover types: *upland hardwoods*, dominated by white and red oaks and hickories, and *bottomland hardwoods*, chiefly cottonwood, sycamore and elm. Of the upland type there was found to be 2,610,108 acres, and of the bottomland 811,354 acres. Although there


Illinois
SCALE
STATUTE MILES
Sample Counties
Boundary
The shaded area inside boundary is where forest land occurs most extensively and forestry is likely to become a major activity

were formerly large areas of cypress brake in Illinois, their combined area now is negligible.

Total volume of timber of sawtimber size now standing in the state is computed as 9,805,350,000 board feet (Composite volume table for Northern Hardwoods, International ¼ inch Log Scale used to compute board foot volumes). Most but not all of this is in stands which can be economically operated at present. In addition, it is estimated that 19,255,000 cords of wood are contained in the boles of smaller trees and in the limbs and tops of sawlog trees.

Specifically, operable stands are believed to contain 9,395,805,000 board feet, and to cover no less than 2,562,406 acres. Of immature stands there are 441,316 acres in the pole class, bearing 409,545,000 board feet of merchantable sawlogs and a considerable volume of cordwood. Also immature are the 417,740 acres of reproduction, containing trees less than five inches DBH. and 200 or more an acre.

Distribution of species in the merchantable stands now operable is indicated by the following table, derived from systematic sampling of many hundreds of forest plots:

Species	*Percent*	*M board feet*
White oak	25.70	2,405,366
Red oak	13.39	1,268,800
Black oak	13.01	1,222,914
Cottonwood	8.46	794,539
Elm	7.63	716,394
Hickory	7.37	692,993
Sycamore	3.88	364,360
Pin oak	3.28	307,863
Basswood	3.06	287,088
Hard maple	2.96	278,375
Soft maple	2.76	259,806
Post oak	2.72	255,241
Ash	1.86	174,774
Walnut	1.38	129,815
Beech	.77	72,434
River birch	.33	31,117
Cucumber	.23	21,150
Tuliptree	.09	8,213
Black Jack	.06	5,572
Sweet gum	.02	1,702
Miscellaneous	1.04	97,289
Totals	100.00	9,395,805

Such then, is the productive capital from which Illinois derives its present yearly cut of timber. Deep and fertile soils, temperate climate and abundant moisture add up to favorable timber growing conditions. Close proximity to great consuming centers should insure dependable markets. Yet, strangely enough, woodland owners are able to supply only one-twentieth of the wood required by industries located within the state.

Actually, it may be alleged that the present yearly cut of 712 million board feet or its equivalent, nearly one-twelfth of the standing merchantable volume, is far too high for safety. However, annual growth amounts to four-fifths as much as is cut, in terms of comparable usable material, plus a very considerable bonus of growth in scattered sawtimber and cordwood not immediately operable. Unsound though such a growth-drain equation may appear, the challenge to the forester of this set of conditions is not so much to attempt to justify the present cut as to increase growth and improve the quality of the entire forest, so that annual yields may be both bigger and better.

Farm woodlands account for 90 percent of forest land. Private estates and industrial holdings are of relative unimportance, amounting to less than 100 thousand acres. About

280 thousand acres are in public ownership, including 185 thousand acres in national forests and 10,000 acres in state forests, mostly in the southern end of the state. Army engineers have jurisdiction over 17,000 acres, while other remnants are in state and county parks, wildlife refuges, and the like.

The public agencies, including the Corps of Engineers, apply technically sound harvesting practices upon lands under their direction. Upon private holdings the story is different; sampling done in the course of the survey indicates that only one farmer in 20 manages his woodland in conformity with forestry principles. Possibly 130 thousand acres of farm woods is receiving protection from grazing and fire and being harvested wisely. Another group of farmers, owning about 290 thousand acres, are giving some protection and using fair judgment in regard to cutting.

Woodland grazing is regarded by foresters as the Number 1 forestry problem in Illinois. From samples taken it is believed that only about 35 percent of all forest area in the state is free from such abuse. In the southern counties, where livestock numbers are fewer, damage is lighter by half. Grazing is heaviest in the northern portion of the state, where farmers are relatively more prosperous. Yet in this very area, extension foresters have demonstrated upon many upland hardwood plots that yearly growth can be doubled, and the assortment of species can be vastly improved by fencing cattle out of the woods and following with simple inprovement cuttings to remove undesirable trees.

In the greater part of the state, probably comprising two-thirds of the forest area, fire is not a serious obstacle to growing timber. The forest areas are small and interspersed with fields and other openings, and the stands are not easily burned. In southern Illinois, where larger areas of contiguous woodland are to be found, a greater hazard exists.

Uncle Sam protects the national forests and private lands within federal boundaries, while the state is responsible for the remainder of this forest region of approximately two million acres. The state organization maintains nine detection towers and employs six wardens full time and several part-time men. Its record is neither wondrously good nor terribly bad, yet increased yearly expenditures for arousing interest in fire-protection and in extending and improving facilities should pay dividends in growth and in stand improvement.

Taxes on forest land vary from 10 to 80 cents an acre a year. While it is doubtful that land taxes discourage forest ownership, certain county officers express the opinion that assessed values ($2 to $25 an acre) are too high for low income producing land and not high enough on land of high fertility. The situation is further complicated by the variation in ratio of assessed to actual land values, which range between 25 and 60 percent. Of tax delinquency there is little at present. Apparently there is in the system of taxation nothing seriously wrong, at least with respect to its effects upon land tenure.

It is interesting to note that the forest area might be increased. Agricultural economists believe that two and a half million acres of land not at present under timber should be put to work growing trees. Indications are that plantations might be expected to yield high returns. State nursery facilities are now sufficient to provide stock for planting about 10,000 acres annually, but plans are to provide for an output three times as great. There are about 73 thousand acres of planted forests in Illinois, half on national forests and other federal lands, 33,000 acres on farms, 1,000 acres on mining sites and 2,000 acres on state forests.

The chief point to be emphasized in these findings is this: since farmers own nine-tenths of the woods, and are themselves 95 percent unacquainted with forest management, it is of paramount importance to reach these landowners with instruction in farm forestry. At the same time, convenient markets are needed to absorb the low grade material in present stands and so make room for trees of better form and higher value, which can be grown. Fuelwood cutting and production of feltwood are promising outlets, but farmers need help in finding others and in learning how to supply them and why their forests deserve such treatment.

Such instruction is available today, on a basis which would have appeared adequate a decade ago, but probably must be increased several fold to get results at a satisfactory rate. Four agencies are active in forest education and action programs within the state. The Department of Forestry, University of Illinois, directs the activities of three extension foresters and two project foresters. The State Division of Forestry directs three project foresters. Also there are two federal agencies.

While the extension men appear to concentrate on selling the idea of forest management to landowners and others, including county agricultural agents (for passing on to their farmer public), project foresters actually go out and assist interested owners to mark timber for cutting. Each of these men has five or more counties to look after; they are paid, half by the state, and half out of federal appropriations (either from Clarke-McNary Act, Norris-Doxey Act, or Bankhead-Jones Act funds), the latter administered by the U. S. Forest Service.

During the war several of these project foresters were kept busy trying to find usable timber and stimulate production. Three other men were added to the force available for such work, and their efforts were aimed at getting trees cut rather than at teaching forestry to farmers.

The Soil Conservation Service employs foresters as farm planners and district conservationists here, but there are no farm foresters under SCS in Illinois (since July 1, 1945, under direction of the U. S. Forest Service). Undoubtedly these men do interest farmers in forestry.

No estimate is available of the number of men needed to sell forestry and teach its application to the landowners of Illinois. Yet inquiry in many counties disclosed a widely held view that there should be more field service, such as marking timber for cutting, estimating and appraising stands and giving general forestry advice. There is need of study of the results to date and planning for large expansion in future. Yet Illinois probably is well toward the front rank in its accomplishments in setting up forest extension, which indicates that the problem demands nationwide study.

Crossties are made from medium size trees with portable mills. This one is near Vienna, Illinois

KNOWING YOUR TREES

SOUTHERN MAGNOLIA

(Magnolia grandiflora Linnaeus)

By WARREN D. BRUSH

NAMED *grandiflora* by Linnaeus because of its large showy flowers, this magnolia has been called by the eminent authority Charles Sprague Sargent, "the most splendid ornamental tree in the American forests." The large creamy-white flowers, along with lustrous, leathery leaves and conspicuous egg-shaped fruit, are its outstanding characters. Not only is it an ornamental tree but it grows to large size and is a source of commercial timber.

The size and simple construction of the flower indicate that the magnolias are among the oldest of our broad-leafed trees. This has been substantiated through the study of fossils which shows that they are among the most ancient trees and shrubs of the world. The present magnolias are a mere remnant of a very extensive group of North Temperate forest trees which formerly grew in Europe, Siberia, western North America, Canada and Greenland before the Glacial Period. They are believed to be almost as ancient as the ginkgo and in early times they probably had a similar distribution.

The natural range of growth of southern magnolia is southeastern North Carolina and along the Atlantic Coast to central Florida and westward along the Gulf Coast into eastern Texas. It occupies a strip about 100 miles wide along the coast except in the Mississippi Delta, where it grows throughout the whole State of Louisiana and in southern Arkansas.

The tree requires a rich soil and considerable moisture for its best growth. It is most commonly found on moist, well-drained soils along streams, near swamps and on other moist locations in the uplands. Although it is a southern bottomland species, it will not survive long inundations and does not occur on the lower bottoms of the Mississippi River that were overflowed before the levees were built, and seldom on the higher bottoms. In Louisiana and Mississippi it is most abundant in the hills between Vicksburg and Baton Rouge.

The Southern Magnolia commonly attains a height of sixty to eighty feet—is a source of commercial timber

The tree does not grow in pure stands but in mixture with other species such as tuliptree, sweetgum, oak and hickory. Forest grown trees are commonly 60 to 80 feet high and two to three feet in diameter, with a straight bole clear of branches up to 40 feet from the ground. They occasionally exceed a height of 100 feet and approach five feet in diameter. The branches are rather small, spreading, or stiffly ascending, forming a pyramidal or conical crown.

Other common names applied to this tree, including evergreen magnolia, laurel-leaved magnolia and laurel bay, refer to the bright green, glossy leaves which measure five to eight inches long and two to three inches wide, and are persistent on the stout woolly, brown stems until the second spring. They are narrowly oval with smooth margins and bluntly pointed at both ends. Smooth and shiny above, they are usually coated beneath with rust-colored down. The foliage is highly valued for decorative purposes, and branches are commonly shipped to northern cities for the Christmas season.

The large, fragrant, creamy-white flowers, contrasting with the lustrous green leaves, appear in the South from April to June, later in the North under cultivation, and are the crowning glory of the tree. Borne singly at the ends of the branchlets, they measure six to eight inches across and can be seen at a distance of a mile. The petals, numbering six to twelve, are wax-like, and each one has a spot of color at the base, which gives the flower a purple center.

Each flower lasts from two to four days, according to the weather, when the petals fall and the egg-shaped or oval fruit appears. When young it is dull pink, covered with thick lustrous hair. At maturity both fruit and hair turn rusty brown. Measuring three or four inches in length and one and one-half inches thick, it bears many scarlet seeds on its surface. They are more or less flattened in shape, measuring one-half inch in length and, as do the seeds of all magnolias when first released, hang for a while by slender white threads before dropping to the ground.

The woolly winter buds are rusty or pale brown and terminal buds measure one to one and one-half inches in length. The brownish-gray bark is one-half to three-quarters of an inch thick and is covered with thin appressed scales.

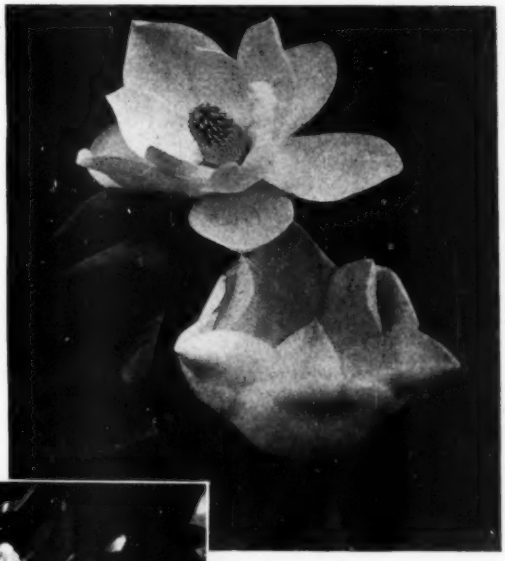
Under favorable conditions the growth of southern magnolia is fairly rapid, forest trees in moist, well-drained locations generally reaching a height of 60 to 80 feet and a diameter of two to three feet at an age of 80 to 120 years.

The light to dark brown heartwood is usually tinged with yellow or green and occasionally contains colorful greenish-black or purplish-black streaks in contrast to the yellowish-white sapwood. The annual growth rings are distinct with a thin whitish line at the beginning and end of each year's growth.

The wood has a close, uniform texture and is generally straight-grained. It is moderately heavy with an average of 35 pounds per cubic foot in an air-dry condition. It is moderately low in shrinkage, moderately weak in bending and compression, moderately stiff, hard, and high in shock resistance. It is not durable when subjected to conditions favorable to decay.

The wood of southern magnolia resembles both yellow poplar (tuliptree) and cucumbertree but is somewhat heavier, harder and stronger. It was formerly marketed in mixture with yellow poplar and sold as such, but it has been found to be such an excellent wood for certain special uses that it is now sold largely under the name magnolia. Its most exacting use is for venetian blind slats for which the wood has proved to be well suited because of its fine, uniform texture, hardness, and ability to remain flat without warping. About two-thirds of the magnolia used in manufacturing wooden products goes into furniture. It also finds important uses as boxes and inside house finish. The total stand of southern magnolia of sawtimber size is estimated at not less than 1,000,000,000 board feet. The annual cut amounts to about 25,000,000 board feet.

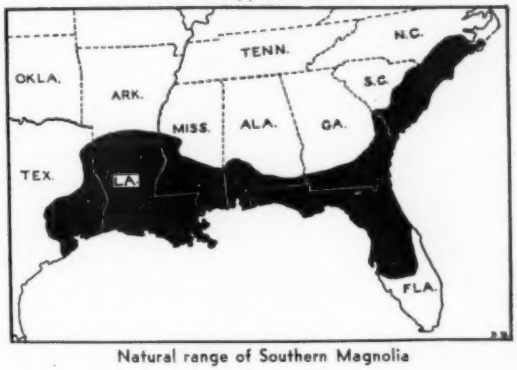
This valuable ornamental tree is planted as far north as New Jersey on the Atlantic Coast, and along the Pacific Coast northward to British Columbia. It is found in the parks of many American cities where the climate will permit.



Creamy-white flowers, six to eight inches across, are borne singly at branchlet ends

The egg-shaped fruit amid lustrous green leaves bears scarlet seeds on its surface

Brownish gray bark, a half inch thick, is covered with thin appressed scales



Natural range of Southern Magnolia

PHILIP WHEELOCK AYRES — A Tribute

By Austin F. Hawes

Philip W. Ayres

WHEN the profession of forestry was new in this country, there were attracted to it several men who had already won distinction in other fields. Of this group was Philip Wheelock Ayres. (Mr. Ayres died on November 3 in New York City—Editor.)

A crusader, in the best sense of the word, Ayres had trained himself at Cornell and Johns Hopkins in philosophy and sociology, and for 12 years had held important positions in charity organizations in Brooklyn, Chicago and New York. In 1895 this work took him abroad to study prison reform in England, France, Germany and Switzerland. While in Europe he had an opportunity to see some of the well managed forests of those countries. His father had been an experimentalist in the raising of trees and other plants, connected with the University of Illinois and it was only natural that the magnificent forests of Europe should make a strong impression upon the young man. His decision to become a forester was made through the influence of his wife, Alice S. Taylor, whom he married in 1899. He then returned to Cornell to study forestry where he was fortunate in coming under the inspiring influence of Doctor Fernow and Professor Filibert Roth.

In October, 1902, he accepted the position of executive forester for the newly organized Society for the Protection of New Hampshire Forests, and for the next decade he was the dynamic spearhead of the movement to create a great national forest in the White Mountains. His early experience in social organizations was of inestimable value in his newly chosen life work. He not only liked people but he knew how to get on with people of varying opinions and points of view. He was, perhaps, the most polite forester, but best of all, his politeness was grounded in good will toward others.

In 1903, the New Hampshire legislature memorialized Congress for a national forest reservation in the White Mountains. Ayres at first enlisted the support of the other New England states, but his political sense soon convinced him that his program was too localized to meet with success. Already there was a well organized movement to preserve the forests of the Southern Appalachians, which had received the support of Presidents McKinley and Theodore Roosevelt. The White Mountain and Southern Appalachian projects were joined together in one bill and Philip Ayres was one of a small group who set out to convert the country.

Wherever opportunity presented from Boston to San Francisco, he spoke before chambers of commerce and other organizations in the interest of this bill. By his convincing presentation and enthusiasm, he won the support of nearly all governors and of numerous organizations. He became an expert in propaganda. Three times the bill passed the United States Senate only to be killed in the House. Those were days of rigid interpretation of the Constitution of the United States. "Uncle Joe" Cannon, then Speaker of the House, could see no justification for the federal government embarking upon a program of forest acquisition.

To meet the constitutional objection, the bill was carefully worded to provide for the purchase of forests to protect the headwaters of navigable streams. To overcome the opposition of those opposed to government ownership, but who favored protection of private forests, other sections were added providing for the cooperation of the Department of Agriculture with the various states in fire protection. Finally through the support of John W. Weeks, Congressman from Massachusetts, the bill, which bore his name, was passed and signed by President Taft on March 9, 1911.

There is no intention of minimizing the efforts of the numerous supporters of this measure, including such men as Harvey N. Shepard, who ably argued the constitutionality of the measure before the Judiciary Committee of Congress, but it is safe to say that without the guiding judgment of Philip Ayres, the accomplishment would have been long delayed and might have passed in less desirable form. He started out to create a national forest in New Hampshire and lived to see a million acres acquired in that state and the adjoining states of Maine and Vermont.

What is more important was the change of the national attitude toward publicly owned forests. Gifford Pinchot, in 1905, had changed the locked-up forest reserves into national forests contributing to public welfare in many ways. Philip Ayres carried the movement still further, for national forests were no longer tracts reserved solely from public domain. They could also be acquired by purchase. Cooperation of the federal government with the states in fire protection was an important by-product of the bill.

The remaining years of Ayres' service in New Hampshire were equally full of achievement. The

Turn to page 41)

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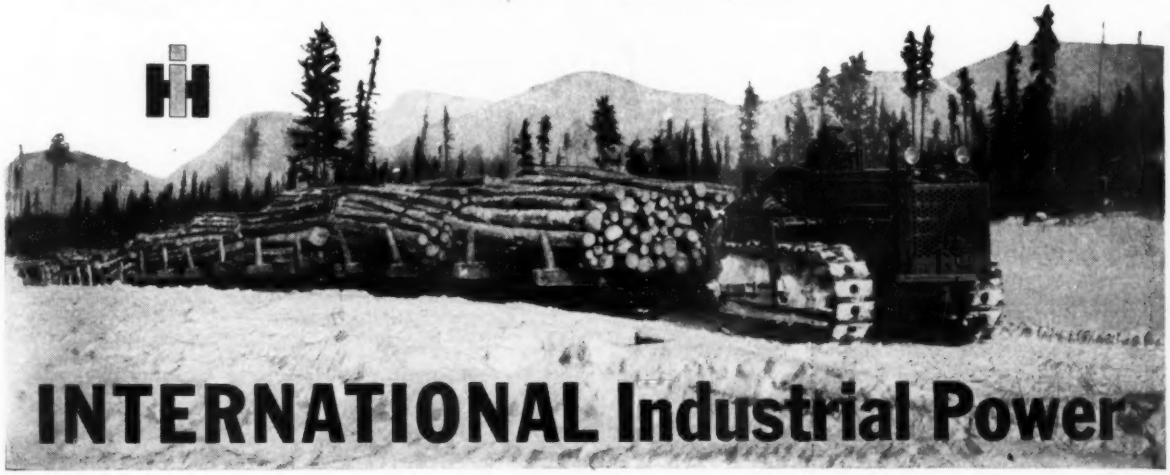


International Organization at Work

Forestry forms the vanguard of an effort which may pave the way to a world-old dream—the assurance of universal peace in our time. Out of the Quebec Conference of the United Nations Food and Agriculture Organization comes the formation of an international forestry organization. Operating on a temporary basis, pending the appointment of permanent personnel, the branch on forestry and forest products is the first division of the Food and Agriculture Organization to get started on an action program.

Already, work has started on five of the most urgent problems involved in international forestry cooperation:

(1) To assemble the facts on forest products supply and requirements as they affect the reconversion period, the dangers of overcutting inherent in trying to meet all war-borne requirements, the extent to which the shortage of forest products may delay reconstruction, and what may be done to correlate supply and requirements on an international basis. In short, the purpose is to provide the United Nations with a world balance sheet on forest products supply and requirements.

(2) The salvaging or replacement of world forestry statistics which have been confiscated, lost, or destroyed by war activity. (The 15,000-volume library of the Nazi-sponsored *Centre International de Sylviculture* has been discovered in Salzburg, and is now in the hands of the Allied occupation forces. Yet to be found are the library and records of the *Comité International du Bois* which were placed in "protective custody" in Berlin by the Gestapo.)

(3) The resumption of international statistic services. These activities had been interrupted by war.

(4) Appraisal of the need for trained personnel and of the status of forestry schools of the world, particularly those in war-torn countries, their capacity and the need for exchange of students among the nations, and for physical teaching and research facilities.

(5) Bringing together information on the industrial advances made by member nations and by the Axis powers during the war as they affect the manufacture and use of forest products. It is planned that such information will be made available to all nations of UNO.

These problems were chosen, from among more than 20 catalogued at the Quebec Conference, because of their being basic to the solution of other world problems in forestry.

The forestry group in Quebec consisted of representatives from 20 nations. United States delegates were Henry S. Graves, dean emeritus, Yale School of Forestry, and a former President of The American Forestry Association, who was chosen as chairman of the forestry committee; Lyle S. Watts, chief, and E. I. Kotok of the U. S. Forest Service; and Tom Gill, of the Charles Lathrop Pack Forestry Foundation, who served as secretary of the international forestry committee, assisted by W. N. Sparhawk of the U. S. Forest Service.

C. Arthur Bruce

Bruce Elected NLMA President

C. Arthur Bruce, executive vice-president of the E. L. Bruce Company, Memphis, Tennessee, was elected president of the National Lumber Manufacturers Association, at the 43rd annual meeting of the association, held in Chicago, November 26-28. He succeeds George T. Gerlinger, Portland, Oregon.

Born in Lawrence, Kansas, and educated at the University of Chicago and Harvard, Mr. Bruce was Republican candidate for governor of Tennessee in 1932 and 1940. He served as a director of The American Forestry Association from 1931 to 1935.

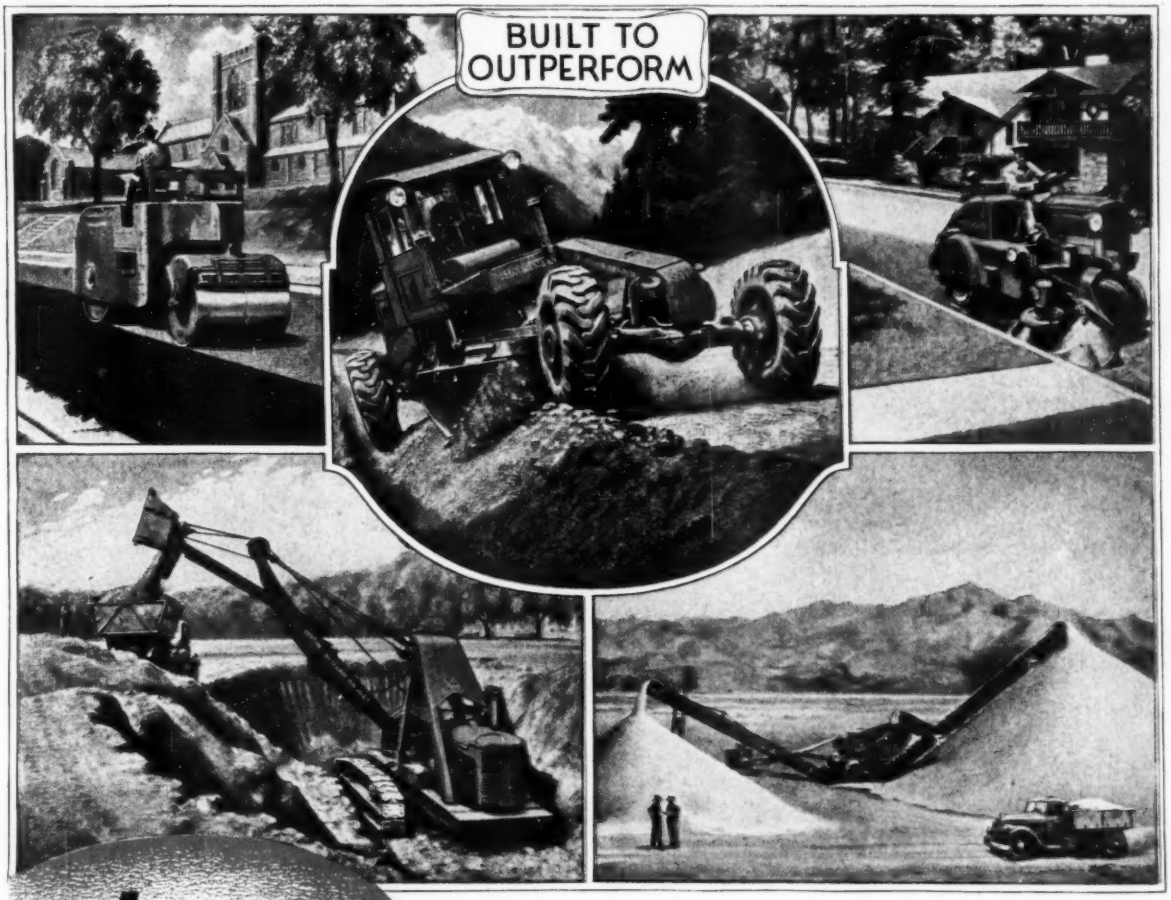
Mr. Bruce has long been active in lumber trade association work, serving last year as regional vice-president of NLMA. During the war he served on the Lumber & Timber Products War Committee.

Western Association Meets

Reactivation of the Western Forestry and Conservation Association and thorough discussion of the proposed Columbia Valley Authority, second growth timber management, and rehabilitation of the Tillamook burn highlighted the association's 36th annual conference in Portland, Oregon, December 13-15.

Rufus Woods of the Wenatchee Daily World supported a Columbia Valley Authority, emphasizing that it would be headed up locally rather than in Washington, D. C. Allan A. Smith, Portland attorney, argued that the Grand Coulee and Bonneville Dams and other projects already authorized fit into a river development scheme fully as effective as the proposed authority and less susceptible to political manipulation. W. B. Greeley of the West Coast Lumbermen's Association opposed the authority as largely abolishing the American scheme of checks and balances and superimposing authority over the management of all forests in the area.

Newly elected officers of the association are: Kenneth Walker, California, president; W. C. Lubrecht, Montana, first vice president; E. C. Rettig, Idaho, C. B. Sanderson, Washington, Earl Birmingham, California, E. B. Tanner, Oregon, and R. C. Filberg, British Columbia, vice presidents; Clyde S. Martin, secretary; C. S. Cowan, treasurer; E. T. F. Wohlenberg, forest counsel.



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SINCE 1859

They Wanted Mahogany

(*Continued from page* 17)

trees and overhead vines. The logs were presumably in rivers which we could cover by boats, or in dry creek beds which we could explore on foot. I announced firmly that I was going to pack my gear in a rubber sack, and went off to do so.

With the cynical farewells of half the townsfolk, we finally boarded the tug for Rama. Julio Pineda met us there, carrying saddlebags which I eyed balefully. We also acquired an assistant guide in John Green, a Mosquito Indian.

At Recreo we transferred our supplies and persons to a large dory hewn out of a mahogany tree and manned by two young Mosquitos. The river narrowed here, and we faced 30 to 50 rapids and falls a day. At times, by leaping overboard, the boatmen could drag the dory up into smooth water. Usually, however, the river was so shallow and so turbulent that the passengers had to get out and walk over the boulders along the shore until the boat had reached quiet water again.

In the spits of land at every rapid, mahogany logs had become wedged during the last flood. Other logs appeared high on the river banks. I examined all of these carefully for the first two days. Without exception, they were in poor condition. During the floods, the water rises from 8 to 12 feet in the creeks and from 20 to 30 feet in the rivers. If the flood is too violent, logs are swept away into the jungle. If it stops too quickly, logs are stranded until the next season. Fortunes can be lost overnight during the floods.

It was now the middle of the dry season, but showers still fell daily. Antelope drank at the river's edge and moved gracefully back into the bush. Overhead, macaws, parrots and wild turkeys darted back and forth across the river.

At night we put up in the thatched huts of the natives along the river. We slung our hammocks from the rafters, high enough so that the household pigs could not rub their backs against us. Then John Green with a half dozen words and a seductive smile would beguile the woman of the house into starting our meal. Our host would gravely discuss the progress of the war, the price of cattle, and the honor of having as his guests not only the British vice-consul but also the important official of the government of North America.

To all this Fleming and I made courteous acknowledgment.

At one of these shacks, a naked, grimy little boy crawled into my lap. A loathsome rash covered him from head to foot, and I set him down quickly on the plea that I needed sleep.

When we reached the end of our boat trip, there were creek beds and camps to explore, so we told our Mosquito boatmen to wait for us at a place called Prescilla Grande. Much to my chagrin, the creek beds were lined with rocks too sharp to walk upon. We made off through the bush on foot to the nearest mahogany camp. When I stopped to gasp for breath half way up the fiftieth hill, I finally relented on the question of horses. As a special favor to an ally, I told Fleming, I would condescend to ride one. Let the horses gasp for breath on these hills!

We reached camp after nightfall. I had a fever and ate lightly. After taking some quinine, I rolled into my hammock, but the fever bothered me and I slept fitfully. I heard the girl cooks lighting their fires at two in the morning and the men as they started out for work at four.

After breakfast the horses arrived in charge of a boy hostler. My horse gave me a searching glance and turned his snake's head quickly away. Trying to look as much like Gary Cooper as possible, I waited until the boy had attached a spur to my boot. Then, mounting easily, I rested in the saddle to enjoy my last comfortable moment for 10 days.

Soon we were off to Camusasca Creek, Pineda leading, with Fleming and myself following in turn and the horseboy and John Green trotting easily in the rear.

Trees formed a canopy over the creek and hardly a ray of sunshine filtered through. The logs were in good condition and of large sizes. I walked stiff-legged along the creek, examining each one carefully for defects. At the end I looked up with a relieved grin. There were no rejects.

As day followed day, we covered the other creeks and camps. Fever plagued me night and morning, but no chills appeared. It was not malaria, clearly, but some obscure jungle fever. Long days in the saddle kept me stiff and sore, and at night I sat down delicately on the first three inches of a stool, like a West Point plebe.

After a week I was satisfied that the logs were there and that they were suitable for war purposes. I then asked a camp captain to show me the mahogany trees he had marked for the current season's cutting. Boys with machetes went ahead of us clearing trails.

There are no mahogany forests. The tree grows sparsely, an average of two trees to an acre being good. One hundred to 150 feet high, two to twelve feet in diameter, the mature tree towers above its forest neighbors. Long, clean trunks extend 50 to 80 feet to the first limb. The bark is gray-brown, fairly smooth, in ridges or large individual scales.

We combed the section systematically, checking the trees that were large enough but not too old, looking for nests of *comejen*, observing the distance to the creeks. Trucks and tractors could not work in that country. The hauling was done by oxen.

At last it was finished. We rode into Villa Somoza, a city of dreams, cold beer and modern plumbing. I sent off a long telegram to the embassy recommending that the contract be renewed. For the first time in 10 days we stripped off our clothes and soaked under the showers for an hour. My fever had suddenly disappeared and I felt wonderful—standing up. The process of sitting down was still an agony.

In two days we were in Prescilla Grande where our boatmen were waiting. For the last time the young hostler removed my spur. For the last time my horse sneered as I dismounted.

Back in Bluefields, I went straight to the doctor. He clucked sympathetically as he examined me. I had lost 15 pounds in three weeks. Those lumps and bumps on my body, what were they? Redbugs, ticks, fleas, ants, snakes and tigers, I replied wearily. Saddlesores, and no doubt leprosy. And this strange fever unaccompanied by chills? He stared fascinated at a red spot on my chest. Had I been exposed to anyone with a rash?

"There was a filthy little boy on the Escondido River," I began.

"Exactly!" he said with satisfaction. "My friend, that obscure jungle disease from which you nearly perished has been isolated and analyzed by modern scientists. Its name is chickenpox."

American Oak

(*From page 27*)

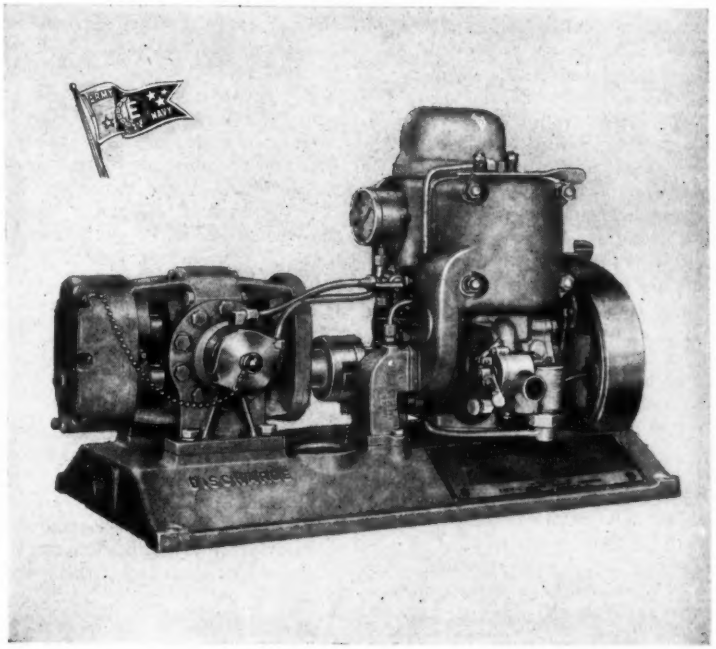
U. S. Infantry Division. The school is part of the education program for the American occupation troops. Here, in a two-month term 220 infantrymen at a time may choose among subjects such as psychology, trigonometry, introductory American forestry, physics, German, French, journalism, business law, foremanship and surveying.

The castle was built in 1704 by Landgraf Carl von Hessen, a predecessor of Frederick II, the soldier-renter, as a hunting castle for his wife. Hence the names Karlshof (Carl's house) and Jagdschloss (hunting-castle) and the cryptic lettering above the door M A L Z H —which stands for Maria Amalia Landgrafin Zu Hessen (Carl's wife). The ruler waxed dramatic in selecting a site for the structure when he loosed a falcon with the statement that he would build where the bird "set down." Not reneging when the uneconomic hawk perched in a swampy area, Landgraf Carl brought swamp-skilled builders from the Netherlands. They built the castle on oak pilings which remain intact to this day, even though the surrounding flat lands have long been drained for cultivation.

What stories the old oak could spin! Now mature and stately with a diameter at breast height of three and a half feet, it towers 98 feet into the European blue. Tales of the Reiher-Beize, courtly falcon hunts in the nearby lowlands by the Landgraf, his men and their ladies, after a species of heron to adorn the ladies' hats; of exciting wild boar hunts in full hunting dress; or of the night Voltaire, fleeing the court of his former close friend Frederick the Great of Prussia, stayed overnight in the castle on his way back to France. Stately intrigue and gaiety mingled in the shadow of the growing tree when in June and July of every year, the Landgraf brought his entire court to Karlshof from Kassel. Included in the entourage were court entertainers — ballet dancers from France and minstrels from Italy— and adding to the drama of the annual summer vacation was the pomp and splendor of several regiments of imperially uniformed H e s s i a n Guards.

Yes, the Yankees liberated an old American when they took Wabern. but the veteran American oak will not return to its native soil. It is, literally, too firmly rooted there.

TYPE "Y"
Portable Pumper



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FIRE-FIGHTING EQUIPMENT DIVISION of the

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SEATTLE, Washington

House of Wood Magic

(*From page* 12)

for by early 1943 damage losses in shipment had been reduced from fifty to three percent.

Basically, the laboratory's packaging program was divided into three parts. As explained by L. J. Markwardt, assistant director, these were (1) a staff of field consultants assigned to on-the-job-service at arsenals, ordnance plants and depots; (2) a research staff to handle special design and development problems, and to prepare specifications and manuals, to establish performance requirements and to correlate practices among various agencies; and (3) a division of technical service trainir g to provide training for officers, inspectors and others on the basic techniques and fundamental principles of packaging.

"Under the guidance of these field consultants," Mr. Markwardt reported, "packaging procedures were changed to conform with specifications, manuals and directives prepared at the laboratory. Types of containers were improved and standardized so that gradually efficiency, order and smooth operation replaced the welter of confusion that characterized early efforts to swing into full stride for war. In all, nine manuals, 37 specifications, 1,560 processing and packaging instructions and numerous guides and directives on packaging were prepared entirely or in large part at Madison.

"As to the technical service training, nearly 16,000 trainees attended 302 separate courses at the laboratory and in the field in the past three years. Of these, 250 courses were on packaging and were attended by 14,500 men and women."

These two arms of the program, of course, were secondary to research in design and development. In this field boxes and crates of solid wood, veneer, plywood, or special fiberboards, drums, barrels, and even burlap and cotton bags were tested. Specialty materials for containers, such as laminated papers, plastics, veneers and paper-wood combinations were tested as to suitability for packaging, together with greaseproof and waterproof papers used as wraps and liners, cushioning materials ranging from foam rubber and excelsior to rubberized hair and asbestos fiber, and plastic coatings which could be sprayed over machinery for protection from moisture.

"To assure that boxes and crates could withstand abuse, rugged tests were set up at the laboratory," Mr. Markwardt revealed. "Boxes were bounced around in rotary drums, dropped from varying heights, stored for months in special hot, damp rooms or at 20 degrees below zero, and sprayed with water to simulate tropical rain."

But packaging design did not stop with the achievement of the most durable container possible. Compactness and economy also were stressed. As a result, by the middle of 1943 Brig. General J. S. Hatcher, chief of the Ordnance Field Service, reported that "on the average, four ships now can carry the weapons which formerly required five. Cutting corners on crates and boxes to eliminate useless air space, together with determination of the minimum weight of lumber needed to protect a given item, has meant an incidental saving of 58 million board feet of lumber."

Here are examples of how this was accomplished: A redesigned crate for the 40 millimeter antiaircraft gun reduced shipping space by 400 cubic feet a gun, or 5,000 gross tons a month; a redesigned box for an antiaircraft gunfire director tripod cut lumber consumption by 55 percent and shipping space by 80 percent.

Of the many special container designs developed at Madison, perhaps none was more important to the war effort than storage battery packs. Without batteries mechanized warfare grinds to a stop.

In the words of T. A. Carlson, of the laboratory's material containers division: "Both battery and package designs as commonly used in peacetime were inadequate to meet wartime hazards. In the intense heat encountered in the holds of ships, the pitch used to weld the cells in aircraft storage batteries tended to soften, allowing the cells to slide out when stowed in an inverted position. As a result, a high percentage of loss occurred. Moreover, overweight boxes which could not be carried by hand were dumped off in unloading, causing further breakage. In one of the early allied invasions a large percentage of the batteries that were shipped separately from the vehicles in which they were to be used arrived in a damaged condition. This resulted in the vehicles themselves being unusable. Through a study of the problem, involving hundreds of tests at the laboratory, similar difficulties were averted in later shipments.

"In the pack designed for vehicle batteries, a wood frame, supported on the terminals and posts, held the cells in position. To keep the frame in place and to provide a moisture-proof pack, the battery was placed in a V-board (exterior grade water-resistant fiberboard) carton sealed with pressure-sensitive tape. The carton was then cushioned in excelsior within a nailed wood shipping container. For shielded batteries such as are used in aircraft, wood blocking was designed to fit inside the case."

Reusable containers developed by the laboratory were another important contribution to mechanized warfare. "In severe military use," explained Mr. Carlson, "the power units and principal drive mechanisms of trucks, tanks, gun-motor carriages and other vehicles frequently must be replaced. Before the adoption of reusable containers, the replacement assemblies were shipped to forward areas in completely nailed containers. Since these were generally destroyed, no container was available for shipping the worn or broken part to the rear for repair. As a result thousands of these parts were damaged by handling during shipment.

FORESTRY CONGRESS
Wins Support of Interior

Abe Fortas, Acting Secretary of the Interior, on December 12 endorsed the American Forestry Congress called this fall by The American Forestry Association. In a letter to W. S. Rosecrans, the Association's president, he said, in part:

"In view of the problems which have arisen because of the heavy drain made upon our resources during the war, your plan for the holding of a national conference to be participated in by all agencies concerned with forest conservation and development should meet with wholehearted approval. The agencies of the Department of the Interior will be pleased to participate in the conference and render every possible assistance to your Association in making it a success."

"Means of blocking and securing irregular and multi-shaped sub-assemblies in the crates, together with efficient and interchangeable means of assembly fastening for the crates, were evolved. Over 100 reusable container specifications were developed for items such as aircraft engines, and transmission, differential and final drive assemblies for vehicles."

(*In the February issue more packaging achievements will be revealed, also the story of the dramatic development of wood aircraft at Madison's house of wood magic.*)

Philip W. Ayres

(*From page* 34)

summer meetings of the society held in the various hotels, under his leadership, were not only delightful affairs, but served to crystallize public opinion in forestry far beyond the borders of the state. They became models for other association gatherings. Through them he was able to prevent the Forest Service from repeating here the mistake it had made in the West of opening the best sites in national forests for private cottages, and thus preserved the wild quality of the mountain scenery.

The organization of a strong State Forestry Department for New Hampshire in 1909, was one of the results of his work. The society also undertook the acquisition, through private contributions, of several tracts of land with the intent of ultimately turning them over to the state. A large area on Kearsarge Mountain has already been transferred to the state, and the beautiful 5,000-acre tract in Franconia Notch, including the Flume and The Old Man of the Mountain will become state property in 1947. This was acquired through contributions from 15,000 donors, a gigantic undertaking conceived by Ayres. Other areas acquired by him and still owned by the society are those on Monadnock, Sunapee Mountain and Lost River.

It was the writer's good fortune to be with Ayres on his last ascent of Monadnock, when he was nearly 80. With him also at the time was Allen Chamberlain, well known Boston writer, who had assisted Ayres in all his efforts. They talked of Henry David Thoreau, who had once had a hut on Monadnock. Thoreau had inspired a love of nature in a youthful nation. Ayres and Chamberlain, working together, had preserved some of the finest specimens of nature for the enjoyment of the people for all time.

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CONSERVATION CALENDAR

Important Bills in Congress With Action to December 15, 1945

Appropriations

H. R. 4805—Making appropriations to supply deficiencies in certain appropriations for the fiscal year ending June 30, 1946, and for prior fiscal years, to provide supplemental appropriations for the fiscal year ending June 30, 1946. To Committee on Appropriations, December 3.

Conservation

S. 1634—McCARRAN—(H. R. 4956)—For establishment of a natural resources policy; to create a national resources council; to provide for a natural resources inventory. To Committee on Public Lands and Surveys, October 29.

Fish and Wildlife

H. R. 4364—LANE—(S. 1496 and H. R. 4362)—To abolish the Parker River National Wildlife Refuge in Essex County, Massachusetts, to authorize and direct the restoration to the former owners of the land comprising such refuge, etc. To Committee on Agriculture, October 11.

National Forests

S. 1615—VANDENBERG—Providing for the release of a portion of the Marquette National Forest for private use and development. To Committee on Agriculture and Forestry, November 23.

National Monuments

H. R. 4933—MURDOCK—To provide for the establishment of a national monument at Travertine Bridge, Gila County, Arizona. To Committee on Public Lands, December 10.

Water and Stream Control

H. R. 4124—GALLAGHER—To provide for approval of the United States-Canadian agreement dated March 19, 1941, for the improvement of the Great Lakes-St. Lawrence Basin. To Committee on Rivers and Harbors, September 19.

S. 555—MURRAY—To establish a Missouri Valley Authority to provide for unified water control and resource development on the Missouri River and surrounding region in the interest of the control and prevention of floods, the promotion of navigation and reclamation of the public lands, the promotion of family-type farming, the development of the recreational possibilities and the promotion of the general welfare of the area, the strengthening of the national defense, and for other purposes. To Committee on Commerce, February 15, 1945. Reported unfavorably, May 7. (Report No. 246) Referred to Committee on Irrigation and Reclamation, May 7. To Committee on Agriculture and Forestry, October 18.

H. R. 4932—MURDOCK—To amend Section 9 of the Boulder Canyon Project Act, approved December 21, 1928. To Committee on Irrigation and Reclamation, October 29.

H. R. 4438—WHITTEN—To amend certain provisions of the Flood Control Act of August 18, 1941 (Public Law 228, 77th Congress) so as to increase the amount paid to States from moneys received by the United States on account of certain leases. To committee on Flood Control, October 18.

Miscellaneous

H. R. 4966—FLOOD—(S. 1682, H. R. 4986, H. R. 4989, H. R. 4990, H. R. 4991, H. R. 4992, H. R. 4993—To prohibit the exportation of logs, lumber, and certain lumber products until the housing and other construction requirements for lumber are being currently met. To Committee on Ways and Means, December 12.

H. Res. 456—LANDIS—Providing for an investigation with respect to the handling and disposition of surplus lumber. To committee on Rules, December 13.

H. R. 3028—BONNER—Cape Hatteras National Seashore, North Carolina, amended. Reported from Committee on Public Lands, October 29, 1945 (Report No. 1161). Passed House, November 5.

H. R. 4129—(H. Res. 360, S. 1120)—Government agency reorganization. Reported from Committee on Expenditures in Executive Departments, September 22. Passed House October 4. Passed Senate, amended, November 19. Sent to conference November 20. Conference report, December 12.

Great Dismal

(*From page* 15)

trees of high commercial value, its borders abound in trees of marked beauty. In this belt grows the swamp red maple which is one of the most spectacular trees for color in the United States. It shows at least a touch of red almost the year around. Other less outstanding trees on the borders are swamp hickory with its delectable nut, water oak, pumpkin ash, and tuliptree.

The dogwood shows to great advantage among the other trees of the swamp border. It is usually slender and delicate although it varies in size from that of a small shrub to a tree 40 feet high. The flowers are very white and showy and often measure four or five inches across.

Lake Drummond is a fresh water lake lying in almost the exact center of the 30-mile-long swamp. It is about seven miles wide and averages not more than 12 feet in depth. Strangely enough, the surface of the lake is slightly higher than the rest of the swamp so that rivers flow out of the region instead of into it. The bowl-like sides of the lake are composed of fallen trees that are cement-

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ed together with the accumulation of centuries of decaying leaves.

The lake has a strange and desolate beauty. The water is the famous "juniper water." It has the color of strong tea, coffee, old Madeira wine, French brandy—the shade apparently dependent upon the writer's favorite beverage. The shallowness of the lake plus the dark color of the water renders it dangerous to small boats. Whenever the wind rises suddenly, as it often does, the ensuing waves tend to drive a small boat onto the hidden cypress snags with disastrous results.

"Juniper water" has sailed the seven seas—or so the romantics would have us believe. Sentimental writers of swamp lore attribute countless virtues to it—it never spoils, nothing is better for warding off malaria, and the taste is delicious.

An aura of mystery and fancy has long veiled the Great Dismal Swamp. Thomas Moore, the great Irish poet, visited Norfolk almost 150 years ago and was greatly impressed by the legend of the disconsolate lover who searched endlessly for his sweetheart lost in the swamp. This legend, and a trip to Lake Drummond in a dugout canoe, inspired him to write the poem, *The Lake of the Dismal Swamp.*

There are numerous tales of slaves running away from their masters to take refuge in the swamp.

Moses White of Elizabeth City, North Carolina, who probably knows more about the swamp than any other man — having walked and waded over thousands of miles of it since he was a boy—remembers stories his father used to tell of escaped slaves. Once a large number of runaways hid in the swamp in North Carolina and set up a sizable community there.

Even after 18 years of timber work in the deep swamp, Moses White would not think of sallying forth into this forbidding area without special equipment for his safety, which includes a specially designed magnetic compass. He recently related that in 1935, a hunter with his dog entered the swamp to look for bear. The man was never heard from again although the dog was found later in a mink trap. A trapper of about 15 years swamp experience went into the swamp four years later and has yet to return. Aside from the animal and snake hazards, entry into the deep swamp is a risky venture for the neophyte without a competent guide.

The swamp is threaded with canals and ditches, most of which have fallen into disuse. They were the waterways dug by negro slaves and used to float logs to the lumber mills. Of this network of waterways, only the Dismal Swamp Canal has been adapted to present day commercial use. Its 22-mile length is the inland waterway between Deep Creek and Elizabeth City, an important link in the Atlantic Intracoastal Highway.

"Ol' Dismal" is getting smaller. Already it has been reduced one-third the size of that recorded by George Washington in his survey. Drainage has permitted farms to be established along its borders. Further uncontrolled encroachments by farms and other commercial projects will necessarily change some of its salient characteristics. It will be a pity if this is allowed to happen for the swamp is unique in that it is untrodden wilderness near great centers of population.

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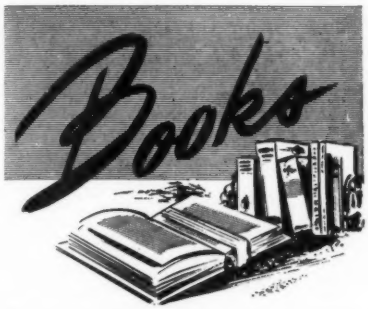

BIRDS OF THE SOUTHWEST PACIFIC, by Ernst Mayr. Published by the McMillan Company, New York, N. Y. 316 pages, illustrated. Price $3.75.

The public is particularly fortunate in the publication of Dr. Mayr's valuable work on the wildlife of the Southwest Pacific.

For this task the brilliant ornithologist of the American Museum of Natural History is well prepared by his seventeen years' study in the area. He has produced an uncommonly fine piece of scholarship, well planned, with color plates, drawings, keys and glossary.

ILLUSTRATED FLORA OF THE PACIFIC STATES, by LeRoy Abrams. Published by Stanford University Press, Stanford, California. 635 pages, illustrated. Price $7.50.

While of primary interest to the student of botany, this is a valuable handbook for anyone interested in the plant life of Washington, Oregon and California—a study to which many noted botanists and illustrators have contributed.

PAY DIRT, by J. I. Rodale. Published by the Devin Adair Company, New York. 242 pages. Price $3.00.

Written by the editor of *Organic Gardening Magazine* for the average reader, this is the first book devoted to the organic method of farming and gardening to be written and published in the United States. Backyard farmers will profit from it as well as the farmer with vast acreage. The author raises the question, "Are the fertilizers generally used today for keeping up yields on our farms detrimental to the soils and finally to human health?" Mr. Rodale shows that they are; and he tells also how organic farming and gardening can improve the situation.

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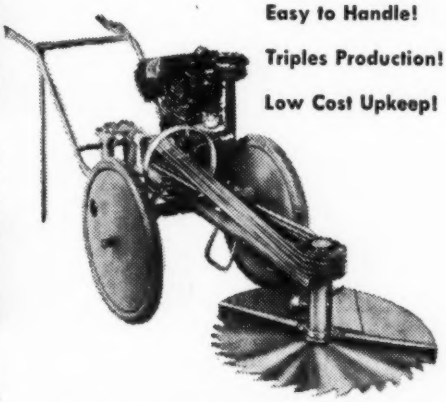

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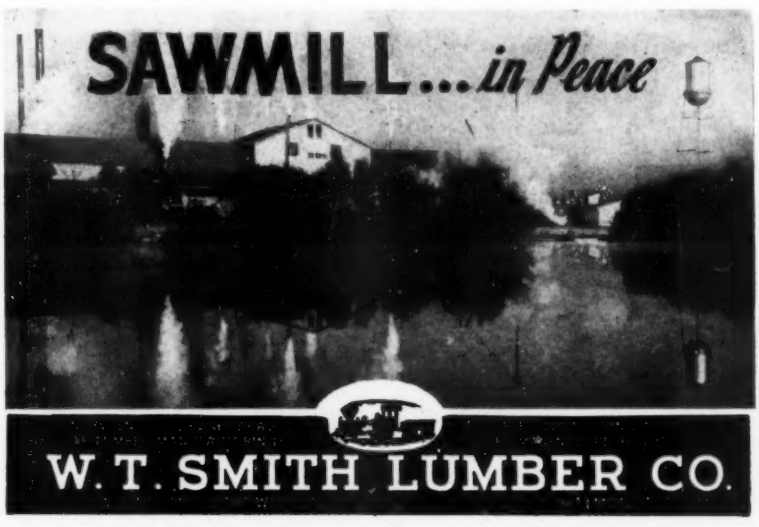

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A Forester's Forest

(*From Page 23*)

And last, there was the long-term task of managing the existing woodlands to improve their composition, their quality and their volume. Like most other wooded areas in the section, my forest needed a respite from the continual exploitation that had been going on for a century and a half. It needed time to accumulate at least a modest forest capital.

Some of my woods needed more than a rest. In this region of vigorous tree growth, young stands soon become crowded. If they are to develop rapidly, the best young trees must have room to grow, freedom from too-close competition. Thinnings were in order. On most chances, I have been able to get out enough merchantable wood to pay operating costs, leaving as a profit the improved quality and increased growth in the thinned stand. However, on some steep, stony acres, the unwanted trees were not worth the cost of removal. On these, I practiced "non-salvage" thinnings—getting rid of what we didn't want the cheapest way, leaving them as they fell to fertilize and protect the soil.

Intensity of economic forest management is directly proportional to the strength and diversity of the markets. Stephentown is strategically located at the hub of a great industrial area with a population of nearly a million. Within easy distance are the great manufacturing centers of western Massachusetts, southwestern Vermont and the capital district of New York. Here are consumed tremendous quantities of forest products, far more than the local forest can ever produce. Literally anything that can be got to the roadside finds ready sale.

In the immediate vicinity are long-established mills buying both hardwood and softwood sawlogs of many species and a turnery taking both logs and bolts of paper birch. In nearby Vermont is an outlet for handle-stock ash. Certain select trees go into piling for use along the Hudson River. The big mill of the West Virginia Pulp and Paper Company at Mechanicville purchases all kinds of pulpwood—spruce, hemlock, aspen, northern hardwoods. Even in hard times the fuelwood market is strong and currently it is insatiable. And, for the poorest quality, there is a cheap but steady market for limekiln wood.

Lest someone think we have achieved Utopia, there are drawbacks. The industrial towns have taken all the good woods labor, and there are too few men left to harvest our sorely needed forest products.

My forest needed, and got, a rest. But even during the waiting period, while the growing stock was being built up, the forest yielded salable products. Our few sawlogs have been cut for our own use. But always there has been market for wood from thinnings and, recently, for both peeled and rough hardwood pulp. Our biggest single sales have been of charcoal wood, where whole blocks of poor woods were clear-cut in preparation for planting. The money yields have not been spectacular but seldom have they failed to pay the taxes.

Almost as important as these have been the auxiliary products. This is a great blueberry country and each year we harvest a crop from our carefully-tended bushes. For Christmas, we have our own trees and boughs and ground pine. The garden yields well of such crops as thrive in a cool climate. Another interesting crop is the wildlife. The forest is bounded, both east and west, by boulder-studded trout streams. On one of these, a pair of beaver established a home in 1933. They developed into a thriving colony, the subject of great popular interest. As the land has returned to forest, deer and snowshoe hare have become increasingly common. Ruffed grouse have always been plentiful.

The forest has provided a place for year-round recreation. It has been a training ground for youngsters interested in nature study and woodcraft. As a place for forest and wildlife research it has been invaluable, for there has always been continuity of observation and record. Here I have studied such varied subjects as forest economics and planting techniques, phenology and the food of beaver. The forest has always presented an unending array of jobs to do and things to investigate, so that there need be no idle moments, physically or mentally.

Most important of all, its ownership has been a liberal education.

Forest management deals with silviculture and protection and markets. It also deals with the lives and aspirations of men. Forests must yield not only products for human use but also opportunities for profitable labor. Today our woods workers are mostly transients, having no stake in the community and continually moving from job to job. Un-

less and until we make sounder, more permanent jobs for our forest laborers, both the forest and the foresters have failed. After 16 years of conservative management, I feel certain that my forest can profitably employ one man full time for six months out of every year, which is almost as good as the land did when devoted to agriculture. Intensive forestry requires a lot of skilled labor. This is a lesson I learned the hard way.

From the very beginning, it was apparent that the old farmhouse simply would not do. It needed repairs and its design was not suited to our needs. So we built a cabin, all new, on the foundation of the old dug-way barn. This provides ample storage and garage space below, as well as a stout foundation. The cabin is a two-room affair. The hemlock frame and sides, the cherry floor, the pine for paneling the interior, all came off the mountain.

Today, my forest is a point of great pride. I have confounded some of my critics who, in the early days, opined that I was crazy. My neighbors have come to view my efforts with tolerance, if not enthusiasm. They applaud my effort, even though they do not follow the example. It affords a rare opportunity to entertain my professional associates in the forest, which is the place where foresters should foregather.

One question that folks always ask is whether I consider my original purchase a good buy. As a strictly business proposition, I have been accumulating forest capital at a rate conservatively estimated at 80 cords on 120 acres a year, while paying my carrying charges from current income. I am certain that the forest now contains more and better, and more cheaply-exploitable wood than it did before. I have learned patience, tolerance and a certain fundamental optimism from watching it grow. I have invested some money and a great deal of time, thought and labor. And I have enjoyed it. Unhesitatingly, I answer that I never have, and never expect to, make a better $500 investment.

Rare Walking Sticks

(*From Page* 21)

species new to science were discovered.

In Mr. Record's words, "It is no exaggeration to say that a large book could be written about the collection without exhausting the subject. Within it is practically the entire range of variation in wood." The heaviest woods that would sink like a stone in a pool—such as lignumvitae, quebracho and snakewood are side by side with balsa and barriguda, featherweights of the wood world.

The color range is even more striking. From the milky white of holly to the jet black of some ebonies can be found woods of shadings so varied as to defy description. There is the delicate pink of guayatil Colorado of Panama, and the royal purple of the purpleheart, the rich color of which is never found in the timber of a living tree and may require years to permeate even so slender a stick as a cane.

Among the most unusual canes in the collection are those of rare pink ivory of Zululand. This singularly beautiful wood was so scarce that when Mr. Block first attempted to include it, he was told that it had not been possible to find a specimen to make a cane for the Prince of Wales at the time of his visit to South Africa. But the collector succeeded as the three slender walking sticks of this famous wood testify. Known as "chieftain wood," tribal law provides that this tree shall be cut only to permit the leader of the Zulu tribe to carry a stick from it, on pain of death.

Many of the woods are remarkable for their aroma, such as camphor from Formosa, sandalwood from India, raspberry jam wood from Australia. Not quite so pleasant is the pronounced garlic effluvium of the *nao d'Alho* of Brazil.

Variations such as curly, wavy, ribbon and bird's eye forms of grain are introduced into the sticks. Burls, those distortions in wood which arise from many buds forcing their way in the normal space for one, can be found in numerous handles. Woods cut from crotches add their distinctive and irregular tracery to the grain.

It is readily understood why Rudolph Block felt impelled to share all this richness with the lay public and dendrologists alike. It was undoubetdly this same feeling that inspired Mrs. Rudolph Block in 1940, just a few months after the death of the collector, to present the famed collection to Yale University's School of Forestry.

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TO provide a basis for informed postwar handling of one of the country's most important natural resources, The American Forestry Association is undertaking a fact-finding survey to determine what effect the war has had upon the country's forests and forest lands and what condition they are in now that manifold problems of reconstruction are at hand. This important undertaking is known as the Forest Resource Appraisal.

Public-spirited citizens, industrialists and organizations alert to the need of forest conservation and development in postwar economy are making this survey possible by underwriting its estimated cost of $250,000.

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When Animals Get Sick

(*From Page* 26)

The chances of any one egg making the complete round is one in 10 million, or even less. The chance of human infestation is much greater. In certain parts of Scandinavia, Japan and even around our own Great Lakes, human infestation is not rare. People of these regions enjoy salads of which raw fish is a part.

Antelopes are purebred racing animals of the plains, the fastest things on four feet. What possible ailments could afflict them? Decayed teeth, of all things!

Antelope have the same number and same general type of teeth as do deer, sheep and goats. The forage of all these animals is about the same except that antelope eat more dry food such as sagebrush, bitterbrush and cured grasses. It may be that the coarse, dry diet does not contain the proper elements for good teeth. Every antelope skull over the age of two years, examined from the Yellowstone country, had dental caries. Many of the six and seven year old class were in very bad shape.

In the wild state elk are hardy animals. When semi-domesticated and fed hay, they become ill with a serious mouth infection caused by a highly virulent bacterium called *Bacillus necrophorus*.

In the hay fed to elk are grasses with barbed awns. These stick in the mouth and make sores. *Necrophorus* finds these sores a fertile field to grow in. Body structure erodes, teeth fall out, chewing becomes more and more difficult and finally impossible. There can be but one end to an advanced case of *necrobacillosis*. When an animal cannot eat, it dies.

Another ailment of elk—and this one affects moose and deer as well—is a horrid thing that causes even men who go into the mountains some bad moments. It is ticks. With elk it is the winter tick, *Dermacentor albipictus*, a vicious beast with eight legs that simply eats its host alive. There are four stages to its growth—egg, larva, nymph and adult. In the spring, elk, already weakened by lack of food during the winter, find themselves literally alive with adult ticks. Each tick draws off about one gram of blood from its host. Five thousand ticks may be present in an ordinary infestation. This means that about a gallon and a half of blood is taken by these greedy parasites, which coupled with the inflammation they set up, and toxic injections, is more than even the most hardy wild animal can endure.

Another tick which infests wild animals is *Dermacentor andersonii*. This one is implicated in Rocky Mountain spotted fever, a disease of humans, as well as tick paralysis of nearly all domestic and wild animals. Native blue and ruffed grouse suffer and die from tick paralysis.

The ailments known to exist in wildlife are many. It takes years of study to root out a single one and probably much more remains to be learned.

One principle seems to stand out. Wild animals in their native habitat, uncrowded, and with plenty of good feed the year round are less troubled with diseases than if they are crowded into an unnatural environment with little to eat.

Little has been done in the way of treatment of the wild creatures. A mountain sheep cannot be captured and given medicine, nor a herd of elk, nor 10,000 deer. Preventive measures such as segregation from domestic stock, special tar-treated salt logs (for deer bot-fly), providing an abundance of food, thinning out of surpluses, killing of the sick ones (in some areas coyotes and cougars are thus beneficial to deer herds), and arranging special devices for sheep and other animals to medicate themselves against ravages of mites and ticks, have been tried.

What about the wisdom of the wild in treating themselves? Does their instinct come to their aid in sickness as well as in health?

In some cases, yes.

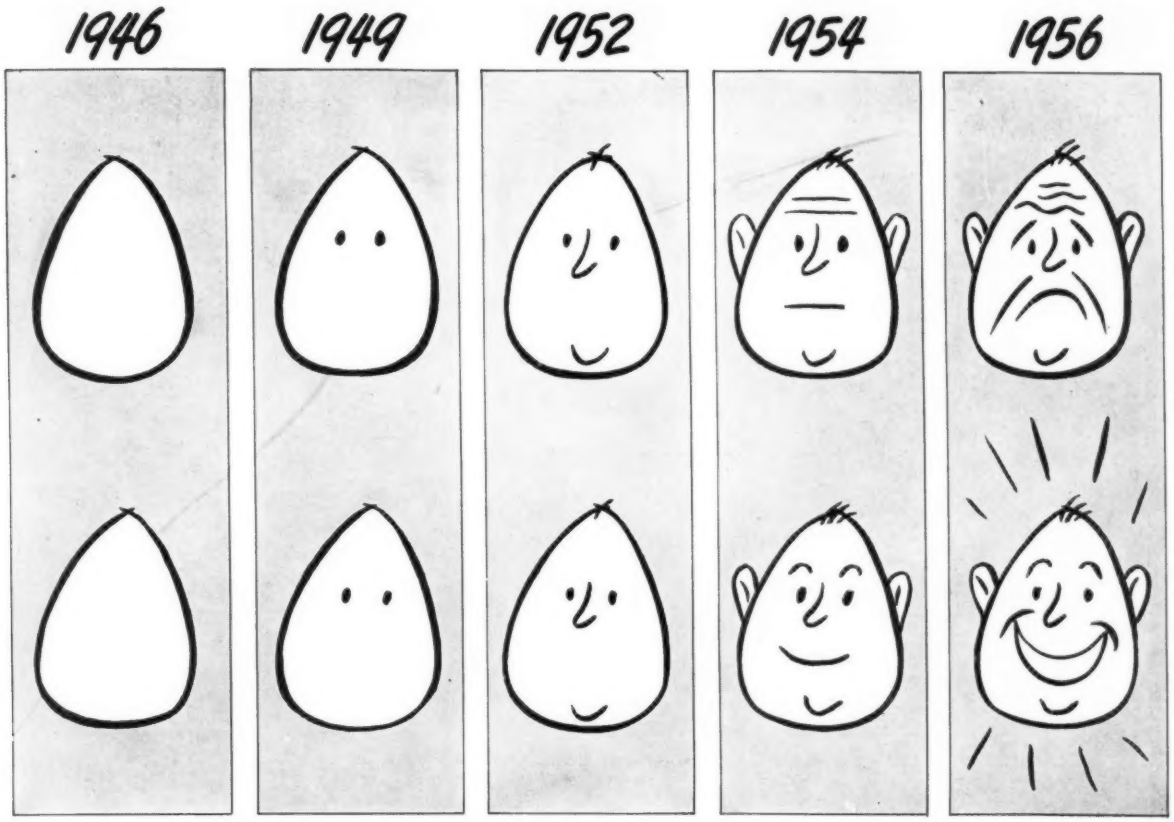
"I wonder if a bear goes into hibernation loaded down with tapeworms?" asked the ranger.

We thought we got the answer that afternoon.

"Its hide wasn't bad, but it was awful poor," the hunter said as he led us to where the skinned bear he had killed lay on the ground. "There ain't enough fat on it to grease a pair of boots—but then no wonder! The critter was eating grass, and grass don't make fat bears."

Out came the post-mortem kit and in a few minutes another fragment was added to the knowledge of wild animal therapeutics.

The long blades of tough grass had gone through the bear's stomach and to the large intestine without being digested in the least. Entangled with it were all the round worms and tapeworms which Bruin had been supporting all summer. Harsh medicine, but effective.



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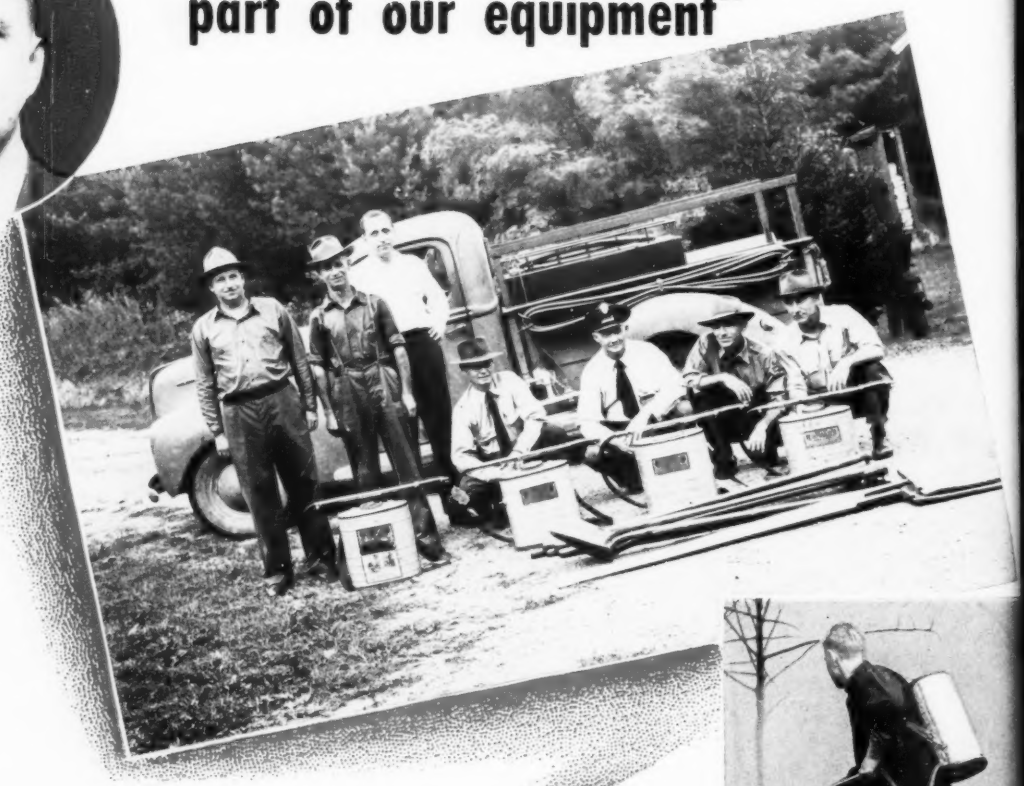

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